UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Analyses of Coal and Selected Rock Samples from the USGS 1975 Drilling Recluse Geologic Analysis Area Northern Campbell County, Wyoming

By

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This report is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey standards.

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Introduction

In order to assess the surface minable portion of the total coal resources in the Recluse geologic analysis area, seven holes were drilled in 1975. Drilling was done by B & B Drilling Company of Libby, Montana, under contract to the U.S. Geological Survey (USGS). About 60 percent of the drilling was cored.

This report represents the results of the various analyses performed on the cored coals and selected portions of the cored rock intervals. The description of the cores were published previously (Hobbs and others, 1977). This report is the third on the drilling in the Recluse area.

The overall objectives of the Recluse geologic analysis area project are to assess the coal resources of the area in terms of quality and quantity, relationship with coal beds in nearby areas, and suitability for surface, underground, or in-situ mining; and to assess factors relating to the siting of future mines and the reclamation potential of the mined land.

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Location

The Recluse model area is located about 40 miles north of Gillette, Campbell County, Wyoming. It includes all of the following USGS 1:24,000 scale topographic and corresponding geologic maps: Homestead Draw SW, Pitch Draw, Recluse, and White Tail Butte. The area includes all of Tps. 55 and 56 N., R. 73 W., and parts of Tps. 54, 55, and 56 N., R. 72 W.; T. 54 N., R. 73 W.; and Tps. 54, 55, and 56 N., R. 74 W. The western portion of the model area is in the Spotted Horse coal field (Olive, 1957) and the balance is in the Little Powder River coal field (Davis, 1912).

Geology

Most of the surface rocks within the Recluse model area belong to the Paleocene Tongue River Member of the Fort Union Formation. Also present are scattered outliers of the overlying Eocene Wasatch Formation (as presently defined). The regional dip is at a very low angle to the west.

The Tongue River Member consists primarily of interbedded mudstones, sandstones, and thick coal beds. In the area drilled, eight regionally correlative coal beds are present. These are, in ascending order:

Smith

Anderson

Canyon A
Canyon B (where split into 2 coal beds)

Canyon (where present as one coal bed)

Cook

Unnamed bed (formerly called Lower Cook or Upper Wall)

Wall

Pawnee

Upper Pawnee
Lower Pawnee (where split)
Cache

The Anderson through the Cook coal beds were penetrated in each hole; however, not all were cored (see table 1).

Drilling

Seven holes, ranging in depth from 401 to 509 ft, were drilled and partially cored. (See table 1, and Hobbs and others, 1977, for detailed descriptions of core.)

The drilling was done using air, with water or water/foam injection when required. All water used was from the same source and the only drilling fluid additive used was a biodegradable liquid foaming agent. There is no evidence that the drilling water and (or) additive may have contaminated the core and affected the subsequent analytical values.

Sample analysis

General

The U.S. Bureau of Mines (USBM) analyzed coal only for proximate, ultimate, Btu/lb, forms of sulfur, and fusibility of ash. The U.S. Geological Survey chemically analysized coal and rock for the following: content of seven trace elements in whole coal; major and minor oxide and trace-element composition of the laboratory ash of coal beds; and major and minor oxide and trace-element composition reported on whole coal basis.

For a description of the rock lithologies and coal see Hobbs, and others, (1977). Table 2 shows the average distribution of selected elements in the Earth's crust (Turekian and Wedepohl, 1961; Taylor, 1964) and may be used for comparison with applicable data shown in this report.

The rock samples selected for analysis were considered representative of a given rock unit. The depth interval of the rock samples, as well as the depth interval of the rock unit it represents including pertinent remarks, are shown on table 3. The analytical data are shown on tables 6a to 6c and represent analyses of overburden, roof and floor rock, and some interburden.

The chemical composition of the rocks compare favorably, with some exceptions, with the data shown on table 2. These exceptions, however, are not in the concentration ranges that would require selective overburden placement upon mining.

The chemical analyses (USGS) of the coal samples are shown on tables 6 through 9, and 11 through 13. For a discussion of and comparison with other coal analyses of the region and the United States see Swanson and others (1976). The chemical composition of the coal compares, with some exceptions, favorably with the data in table 2. The values that are exceptions do not indicate a concentration that would be environmentally deleterious.

The amount of major oxides present as well as their ratio to each other are important to the individual coal user, especially for boiler design. The trace-element composition, as well as some of the other elements such as sulfur, show a higher concentration in the roof and floor coals. This should be expected as these are generally the areas of higher ash content (clays and muds) relative to the overall coal bed (see tables 6, 7, and 10 through 14).

The USBM analyzed a rock interval, 360.2 to 361.8 feet, separately (table 10f), but the weighted average analysis of the whole bed (table 14) included this parting to show the effect of not removing the parting after mining. The effect of removing the parting from the coal bed can be calculated from the data in table 10f.

The analyses done by the USBM are given in tables 10a to 10h; the weighted average values by coal bed and drill hole are given in Table 14. For comparison with other coals see Swanson and others (1976).

Moisture content can vary considerably, even in samples of the same coal, depending on how the coal is handled prior to analysis. In order to have the as-received analysis be more meaningful relative to other samples and other coal beds, a standardized sampling procedure was followed so that the coal would not become dry. After placing the samples in a 0.006 inch (6 mil) polyethylene bag, enough moisture was added to maintain 100 percent relative

humidity. After as much air as possible was forced out of the bag, it was tightly sealed and placed in a second bag which was also sealed. The as-received moisture contents show a good correlation with each other. The range of moisture contents of individual coal-beds among drill holes is considered low: 4.1 percent for the Anderson coal bed, 1.2 percent for the Canyon A coal bed, 0.6 percent for the Canyon B coal bed, and 2.5 percent for the Canyon coal bed. These data are shown on table 4.

These moisture values are not equilibrium moisture values and are probably slightly higher than equilibrium values. Equilibrium moisture determinations were not made of the 1975 samples; however, limited determinations--two samples each of the Anderson Canyon A and Canyon B coal beds--made from cores acquired from the 1976 drilling in the immediate area show these equilibrium moisture values:

			Average
Anderson	No. 1	30.48 percent	
	No. 2	29.01 percent	29.75
Canyon A	No. 1	27.44 percent	
	No. 2	31.19 percent	29.32
Canyon B	No. 1	30.89 percent	
	No. 2	28.86 percent	29.88

Assuming these equilibrium moisture values are representative, they are less than the as-received weighted average moisture contents by the following, all of which are significant for apparent rank determination: Anderson, 2.9 percent; Canyon, 3.8 percent; and Canyon B, 4.6 percent. The low heat value of the coal relative to bituminous coal is due to its lesser degree of maturation of the coal; that is, it is lower in rank. Moisture content is a major factor, but sulfur is not, because there is so little of it.

Sulfur content

The total sulfur content and the ratio of inorganic to organic sulfur increases generally are higher in the floor and roof coals (tables 10 through 14). The overall sulfur content on a total bed basis ranges from 0.2 to 0.6 percent, as-received (table 14). The average total sulfur is 0.4 percent. For the most part, the inorganic (sulfate and pyritic) forms are a minor portion of the total sulfur content, about 16 percent, which equals 0.064 percent of the total coal. Sulfate sulfur form is about 27 percent of the total inorganic sulfur. This is not excessive and probably indicates a slight weathering effect caused by circulating ground water.

Classification of coals by rank

Determination of the moist, mineral-matter-free heating value, which allows calculation of apparent rank requires equilibrium moisture values for the samples analyzed. As previously noted, these moisture determinations were not made. However, using the equilibrium moisture data from the 1976 drilling, together with the weighted average as-received Btu/lb values, an apparent rank was calculated for coal beds from the 1975 drilling (table 5). This calculation is in accordance with American Society of Testing and

Materials (1972) D388-66 standard, section 7.2, Parr formula 3, p. 56. This apparent rank determination is qualified because equilibrium moisture data from other drill holes were used, but it is considered to be a good approximation. These data are shown on table 5. Classification of these coals according to table 1 American Society of Testing and Materials (1972) shows that these coals range in rank from lignite "A" to subbituminous "C". The range in heating values on a moist, mineral matter-free basis is low -- 8064 Btu/lb to 8526 Btu/lb. This may indicate that the zone of southward transition from the lignites to subbituminous coals in Powder River Basin and Great Plains occurs in this area. Coals of the Recluse Area can be considered to be predominantly subbituminous "C" rank.

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Table 1.--Recluse Model Area 1975 USGS Drill Holes

[Location coal and rock intervals cored.
Measurements in feet. Rock cored 1,299.7;
Coal cored 507.0; Total cored 1,806.7;
Rotary drilled 1,303.3; Total footage 3,110.0]

Hole no.	Location	Surface elevation (feet)	Coals cored		Rock Intervals cored (feet)	Total depth (feet)
			Bed name	Intervals (feet)		
RM-1	SE 1/4 SW 1/4 NW 1/4, sec. 33	4190	Anderson	148.2-185.4	83.0-148.2	402
	T. 56 N., R. 72 W.				185.4-187.8	
			Canyon A	187.8-210.3	210.3-222.0	
RM-2	SW 1/4 NE 1/4, sec. 32	4238	Anderson	198.4-232.6	20.0-198.4	465
	T. 56 N., R. 72 W.		Canyon A	236.5-265.2	232.6-236.5	
			Canyon B	311.2-330.6	265.2-311.2	
					330.6-343.0	
RM-3	NE 1/4 NW 1/4 NW 1/4, sec. 25	4195	Anderson	92.5-123.9	20.0- 92.5	442
	T. 56 N., R. 73 W.				124.5-153.0	
RM-4	NE 1/4 SW 1/4 SW 1/4, sec. 25	4145	Anderson	129.4-167.0	23.0-129.4	422
	T. 56 N., R. 73 W.		Canyon A	298.0-320.5	167.0-298.0	
			Canyon B	323.0-349.0	320.5-323.0	
					349.0-358.0	
RM-5	SW 1/4 SE 1/4 SE 1/4, sec. 27	4186	Anderson	135.2-169.2	130.0-135.2	509
	T. 56 N., R. 73 W.		Canyon	354.5-395.5	169.2-273.0	
					340.0-354.5	
					395.5-406.0	
RM-6	NW 1/4 NE 1/4, sec. 21	4106	Anderson	88.9-120.0	20.0- 88.9	405
	T. 56 N., R. 73 W.		Canyon	265.5-306.4	120.0-256.5	
					306.4-325.0	
RM-7	NE 1/4 NW 1/4, sec. 26	4194	Anderson	133.2-170.3	20.0-133.2	465
	T. 55 N., R. 73 W.		Canyon	286.2-329.6	170.3-286.2	
			Cook	370.0-382.0	329.6-370.0	
					382.0-383.0	

Table 2.--Average distribution of selected elements in the earth's crust

["X" indicates that only order of magnitude estimates could be made]

	Sandstone[1]	Shale[1]	Crustal[2]
	In percent		
Si	36.8	7.3	28.15
Al	2.5	8.0	8.23
Ca	3.9	2.21	4.15
Mg	.7	1.5	2.33
Na	.33	.96	2.36
K	10.7	2.66	2.09
Fe	.98	4.72	5.63
Ti	.15	.46	.57
	Parts per million (ppm)		
As	1	13	1.8
Cd	.X	.3	.2
Cu	X	45	55
F	270	740	625
Hg	.03	.4	.08
Li	15	66	20
Pb	7	20	12.5
Sb	.0X	1.5	.2
Se	.05	.6	.05
Th	1.7	12	9.6
U	.45	3.7	2.7
Zn	16	95	70
B	35	100	10
Ba	X0	580	425
Be	.X	3	2.8
Co	.3	19	25
Cr	35	90	100
Ga	12	19	15
Mo	.2	2.6	1.5
Ni	2	68	75
Sc	1	13	22
Sr	20	300	375
V	20	130	135
Y	40	26	33
Yb	4	2.6	3
Zr	220	160	165

[1]Turekian and Wedepohl, 1961.
[2]Taylor, 1964

Table 3.--Rock core sample interval and rock interval represented in USGS Drill holes RM-1, 3, and 4

Hole no.	Sample no.	Rock sample interval (feet)	Rock interval represented (feet)	Remarks
RM 1	D176272	83.0- 97.3	61.0- 97.3	Core point--80.0; 61.0 to 80.0 projected on sample and natural gamma log interpretation.
	D176273	98.3- 99.2	97.3-101.2	Roof rock--Anderson rider coal bed.
	D176274	101.2-101.9	101.2-102.3	Roof rock--Anderson rider coal bed.
	D176275	107.3-107.9	107.3-107.9	Parting--Anderson rider coal bed.
	D176276	108.4-112.6	108.4-112.6	Floor rock--Anderson rider coal bed.
	D176277	118.6-122.0	112.6-134.6	
	D176278	136.5-139.5	134.6-141.7	Roof rock--Anderson coal bed.
	D176279	143.9-147.4	141.7-148.2	Roof rock--Anderson coal bed.
	D176280	210.3-217.7	210.3-217.7	Floor rock--Canyon A coal bed.
	D176281	217.7-222.0	217.7-226.0	End coring 222.0 to 226.0 from natural gamma log.
RM 3	D176532	63.0- 63.5	61.8- 63.5	
	D176533	72.0- 72.5	68.0- 73.0	Roof rock--Anderson rider coal bed.
	D176534	86.0- 90.0	81.7- 92.5	Roof rock--Anderson coal bed.
	D176535	124.5-130.5	124.5-130.5	Floor rock--Anderson coal bed.
	D176536	131.1-132.6	130.5-133.7	
	D176537	134.4-135.1	133.7-139.0	
RM 4	D176517	34.4- 35.4	24.0- 35.5	
	D176518	36.1- 37.2	35.5- 38.8	
	D176519	43.0- 43.9	43.0- 49.9	
	D176520	50.2- 51.5	49.9- 53.0	
	D176521	54.0- 55.3	53.0- 56.5	
	D176522	56.9- 58.4	56.5- 61.9	
	D176523	62.5- 63.0	61.9- 64.0	
	D176524	76.0- 77.6	68.0- 81.6	
	D176525	90.3- 93.1	81.6- 95.2	
	D176526	95.6- 96.4	95.2- 97.5	
	D176527	103.0-110.2	102.2-110.7	Roof rock--Anderson rider coal bed.
	D176528	113.4-119.3	112.5-124.2	
	D176529	118.0-118.4	118.0-118.4	Siltstone streak.
	D176530	128.6-129.4	128.6-129.4	Roof rock--Anderson coal bed.
	D176531	124.2-127.8	124.2-128.6	Roof rock--Anderson coal bed.

Table 4.--Comparison of coal bed proximate analysis moisture

Hole no.	Net coal thickness (feet)	Moisture As recieved (percent)
	Anderson coal bed	
RM-1	36.9	32.0
RM-2	34.2	32.1
RM-3	31.4	31.3
RM-4	36.2	31.3
RM-5	33.4	35.4
RM-6	31.1	32.0
RM-7	37.1	34.5
Range	31.4-37.1	31.3-35.4
Weighted average	34.3	32.7
	Canyon A coal bed	
RM-1	16.6	32.6
RM-2	25.2	32.8
RM-4	20.5	33.8
Range	16.6-25.2	32.6-33.8
Weighted average	20.8	33.1
	Canyon B coal bed	
RM-2	19.4	34.1
RM-4	26.0	34.7
Range	19.4-26.0	34.1-34.7
Weighted average	22.7	34.5
	Canyon coal bed	
RM-5	40.6	32.2
RM-6	35.3	32.0
RM-7	41.4	34.5
Range	35.3-41.4	32.0-34.5
Weighted average	39.1	33.0
	Cook coal bed	
RM-7	12.4	31.7

Table 5.--Average Btu/lb values of analyzed beds in the Recluse area: as received, corrected for equilibrium moisture and on a moist, mineral matter-free basis, and the apparent rank (qualified)

Hole no.	Coal bed	Btu/lb values[1] As received (analysis)	As received, corrected for (equilibrium moisture)	Moist, mineral-matter-free[2]	Apparent rank[3] (qualified)[4]
			1976 Drilling		
76-105	Anderson	6970	7800	8330	Subbituminous "C"
	Canyon A	6750	7440	8320	Subbituminous "C"
	Canyon B	7830	8050	8490	Subbituminous "C"
			1975 Drilling		
RM-1	Anderson	7570	7810	8320	Subbituminous "C"
	Canyon A	7510	7880	8390	Subbituminous "C"
RM-2	Anderson	7210	7460	8240	Lignite "A"
	Canyon A	6780	7130	8060	Lignite "A"
	Canyon B	7460	7940	8390	Subbituminous "C"
RM-3	Anderson	7490	7660	8260	Lignite "A"
RM-4	Anderson	7620	7780	8420	Subbituminous "C"
	Canyon A	7460	7960	8300	Subbituminous "C"
	Canyon B	7530	8090	8490	Subbituminous "C"
RM-5	Anderson	7030	7450	8270	Lignite "A"
	Canyon	7030	7320	8260	Lignite "A"
RM-6	Anderson	7390	7620	8310	Subbituminous "C"
	Canyon	7260	7550	8320	Subbituminous "C"
RM-7	Anderson	7340	7860	8350	Subbituminous "C"
	Canyon	7570	8030	8530	Subbituminous "C"
	Cook	7000	7230	8290	Lignite "A"

[1]Rounded to nearest 10 Btu/lb.

[2]Calculated from ASTM (1972, section 8.2, equation 3)

[3]Based on ASTM (1972), Table 1.

[4]See text.

Table 6a.--Major and minor oxide and trace-element composition of the rock samples from USGS core hole RM-1 SW 1/4 NW 1/4 sec. 33, T. 56 N., R. 72 W., Campbell County, Wyoming

[The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element symbol means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Anderson Overburden rock 83.0 ft. to 147.4 ft., floor 21.0.3 ft. to 222.0 ft.

Sample	Depth (feet)	SiO_2 %	Al_2O_3	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %	P_2O_5 %
D176272	83.0- 97.3	59	14	2.0	2.31	0.34	2.5	6.2	0.13	0.66	0.94 L
D176273	98.3- 99.2	59	13	1.4	1.77	.36	2.2	8.0	.16	.64	.92 L
D176274	101.2-101.9	6.2	1.8	1.5	.45	.20	.22	2.4	.013	.096	.17 L
D176275	107.3-107.9	73	10	.38	.72	.42	2.1	2.1	.008	.50	.94 L
D176276	108.4-112.6	69	13	.63	1.25	.26	2.5	3.8	.030	.73	.95 L
D176277	118.6-122.0	66	12	.69	1.17	.24	2.3	6.4	.16	.71	.92 L
D176278	136.5-139.5	59	13	1.2	1.62	.23	2.1	5.7	.11	.68	.89 L
D176279	143.9-147.4	51	11	.74	1.03	.18	1.8	6.8	.17	.62	.80 L
D176280	210.3-217.7	73	9.3	.54	.77	.16	.69	1.9	.018	.15	.92 L
D176281	217.7-222.0	70	15	.20	.70	.16	2.0	2.8	.046	.73	.93 L

Sample	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D176272	0.19 L	10	0.9L	33	745	0.12	32	24 L	1.0	0.9
D176273	.18 L	10	.9L	30	640	.08	29	23 L	1.0	1.6
D176274	.034L	20	.2L	9	70	.21	3	4 L	1.0	1.1
D176275	.19 L	10	.9L	22	485	.10	17	24 L	.3	1.0
D176276	.19 L	5	1.0L	25	710	.10	28	24 L	.4	.8
D176277	.18 L	8	.9L	27	565	.11	30	23 L	.5	1.0
D176278	.18 L	8	.9L	32	640	.09	29	22 L	.5	1.7
D176279	.16 L	15	.8L	74	470	.16	27	20 L	.8	1.8
D176280	.18 L	4	.9L	19	415	.11	30	23 L	.6	1.0
D176281	.19 L	5	.9L	19 L	435	.04	23	23 L	.5	.6

Table 6a.--Major and minor oxide and trace-element composition of the rock samples from USGS core hole RM-1 SW 1/4 NW 1/4 Sec. 33, T. 56 N., R. 72 W., Campbell County, Wyoming--Continued

Sample	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S
D176272	12.7	3.8	113	70	700	3	500 L	15	70	30
D176273	14.3	4.4	106	70	700	N	N	15	70	30
D176274	3.0L	1.9	24	100	300	1.5	100 L	5	10	5
D176275	16.6	3.3	100	70	500	N	500 L	10	30	15
D176276	17.2	3.8	112	70	700	N	500 L	15	70	30
D176277	13.0	4.1	115	70	700	N	500 L	15	70	20
D176278	11.7	3.5	115	70	700	N	500 L	15	70	30
D176279	20.8	4.9	102	50	500	N	500 L	10	50	15
D176280	17.9	5.8	125	70	500	N	500 L	15	70	30
D176281	19.0	5.0	100	70	300	N	N	10	70	15

Sample	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-S
D176272	N	100 L	N	20	N	50	15	150	150	50
D176273	N	100 L	N	20	150 L	50	15	150	150	30
D176274	10	15	1	3	20 L	10	3	300	20	10
D176275	N	N	N	20 L	B	30	10 L	150	70	30
D176276	N	100 L	N	20	N	50	15	150	70	50
D176277	N	100 L	N	20	N	30	15	150	150	50
D176278	N	100 L	N	15	150 L	50	15	150	150	50
D176279	N	70 L	N	15	100 L	50	10	100	100	50
D176280		100 L	N	30	N	30	15	100	150	30
D176281		N	N	20	N	30	10	70	70	30

Sample	Yb ppm-S	Zr ppm-S	Total C%	Orgnc C%	Crbnt C%	Total S%
D176272	3	150	2.47	1.6	0.82	0.15
D176273	3	150	4.62	3.6	.48	.24
D176274	1	20	56.2	56	.12	1.77
D176275	2	150	5.10	5.1	.02	.16
D176276	3	200	3.00	2.9	.11	.12
D176277	3	200	2.37	1.8	.56	.15
D176278	5	150	4.57	4.1	.48	.36
D176279	5	100	1.05	9.8	.67	.37
D176280	3	150	2.13	2.0	.11	.06
D176281	3	200	1.63	1.3	.34	.10

Table 6b.--Major and minor oxide and trace-element composition of the rock samples from USGS core hole RM-3, NW 1/4 NW 1/4 sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming

[The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Anderson Overburden rock 63.0 to 90.0 ft., floor 124.5 to 135.1 ft.

Sample	Depth (feet)	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %	P_2O_5 %
D176532	63.0- 63.5	40	5.3	33	0.93	0.48	1.2	2.1	0.058	0.22	0.16
D176533	72.0- 72.5	66	12	.97	1.23	.39	2.2	5.2	.065	.56	.095L
D176534	86.0- 90.0	53	16	1.3	1.72	.18	2.4	5.8	.12	.62	.11
D176535	124.5-130.5	64	21	.29	.89	.24	2.0	2.2	.007	.72	.094L
D176536	131.1-132.6	63	17	.36	.88	.23	2.1	5.4	.017	.71	.093L
D176537	134.4-135.1	23	7.0	3.8	2.82	.14	.86	38	.21	.29	.57

Sample	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm	Th ppm
D176532	2	1.0L	20 L	330	0.03	20 L	25 L	0.4	0.4	8.9
D176533	5	1.0L	22	670	.06	26	24 L	.7	.6	16.0
D176534	12	.9L	48	785	.12	37	21	1.0	1.4	17.5
D176535	8	.9L	32	595	.14	62	28	1.0	1.1	29.7
D176536	8	.9L	25	635	.08	43	23	.9	1.0	21.6
D176537	8	.8L	16 L	885	.05	24	20	.9	.6	13.5

Sample	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Nb ppm-S	Ni ppm-S	Sc ppm-S
D176532	1.6	32	50 L	300	N	10 L	30	10	N	15	10 L
D176533	4.7	79	50	700	N	15	70	15	20 L	20	15
D176534	4.1	117	50	700	N	15	20	15	15 L	20	15
D176535	5.8	80	70	700	N	10 L	100	30	20	20	15
D176536	4.9	61	50	700	N	10 L	70	30	20 L	15	15
D176537	8.9	56	50 L	500	5	7 L	20	B	15 L	15	10

Sample	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S	Total C%	Orgnc C%	Crbnt C%	Total S%
D176532	70	50	20 L	2	100	6.31	0.1	6.18	0.10L
D176533	100	100	30	5	200	1.37	.8	.55	.10L
D176534	150	100	20	2	150	7.31	7.1	.22	.16
D176535	150	200	20	3	150	.74	.7	.02	.10L
D176536	150	150	30	5	150	.69	.2	.45	.10L
D176537	100	70	50	B	100	6.79	.1	6.69	.10L

Table 6c.--Major and minor oxide and trace-element composition of the rock samples from USGS core hole RM-4 NWNW sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming

[The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Overburden interval above Anderson coal bed 34.4 to 129.4

Sample	Depth (feet)	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %	P_2O_5 %
D176517	34.4- 35.4	67	12	2.8	2.21	0.68	2.4	3.3	0.048	0.50	0.14
D176518	36.1- 37.2	54	15	2.7	2.60	.50	2.9	7.9	.14	.59	.19
D176519	43.0- 43.9	55	16	1.3	2.07	.44	2.9	6.4	.10	.59	.19
D176520	50.2- 51.5	58	12	6.7	3.20	.66	2.3	3.9	.06	.51	.17
D176521	54.0- 55.3	57	13	6.7	3.21	.64	2.5	4.1	.073	.55	.17
D176522	56.9- 58.4	55	13	6.9	3.24	.60	2.5	4.4	.074	.54	.18
D176523	62.5- 63.0	18	4.6	44	1.41	.30	1.1	3.5	.16	.16	.24
D176524	76.0- 77.6	54	15	5.1	3.08	.49	2.9	5.3	.091	.55	.19
D176525	90.3- 91.1	56	15	2.1	2.22	.36	2.8	8.0	.15	.58	.15
D176526	95.6- 96.4	83	7.9	.3	.51	.42	2.3	1.5	.017	.31	.097L
D176527	103.0-110.2	50	12	.97	1.60	.23	2.2	7.7	.12	.48	.12
D176528	113.4-119.3	56	15	.96	1.57	.25	2.5	5.6	.083	.61	.12
D176529	118.0-118.4	25	6.9	3.4	3.26	.14	1.3	33 .56	.30	.17	
D176530	128.6-129.4	59	15	.56	1.01	.25	2.2	2.4	.009	.61	.084L
D176531	124.2-127.8	51	15	.92	1.34	.23	2.4	5.1	.11	.59	.085L

Sample	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm	Th ppm
D176517	8	1.0L	27	515	0.08	23	24 L	1.6	0.6	15.4
D176518	15	.9L	38	385	.09	33	24 L	1.8	.8	11.0
D176519	100	.9L	42	1200	.15	30	23 L	1.5	1.7	12.1
D176520	8	1.0L	27	1140	.08	24	24 L	1.0	.6	14.1
D176521	5	.9L	38	1230	.07	28	24 L	1.0	.7	12.4
D176522	8	1.0L	41	700	.08	28	24 L	1.1	.7	13.1
D176523	2	1.0L	20 L	245	.05	10 L	24 L	1.7	.3	3.0L
D176524	5	1.0L	45	1200	.07	28	24 L	1.2	1.0	12.3
D176525	10	.9L	35	680	.10	31	23 L	1.2	.6	20.8
D176526	5	1.5	19 L	700	.06	10 L	24 L	.4	.4	12.8
D176527	5	.9L	29	475	.07	28	23 L	.4	.6	18.8
D176528	35	.9L	36	615	.15	35	23 L	.4	.9	25.3
D176529	10	.8L	20	440	.08	16	20 L	.2	.4	8.3
D176530	12	.8L	36	515	.18	40	21 L	.3	1.0	34.6
D176531	12	.8L	47	495	.17	35	21 L	.5	1.4	25.5

Table 6c.--Major and minor oxide and trace-element composition of the Rock samples from USGS core hole RM-4, NWNW sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming--Continued

Sample	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	La ppm-S
D176517	2.6	83	50	700	N	N	15	100	20	N
D176518	3.6	113	70	700	N	N	15	100	30	N
D176519	4.4	147	70	700	N	N	20	100	30	100 L
D176520	2.6	82	70	700	N	N	15	70	15	N
D176521	2.5	95	70	700	N	N	15	70	15	N
D176522	2.9	93	70	700	N	N	15	70	20	N
D176523	1.0	39	50 L	200	N	N	10 L	50	10	N
D176524	3.2	106	50	700	3	N	15	70	20	N
D176525	3.4	110	70	700	3	N	15	70	20	100 L
D176526	3.1	54	50 L	700	N	N	10 L	30	15	N
D176527	5.0	98	70	700	3	N	15	70	15	100 L
D176528	3.5	123	70	700	3 L	500 L	20	100	30	100 L
D176529	2.2	69	50 L	500	5	500 L	7	50	B	N
D176530	5.5	118	70	700	N	N	15	70	15	100 L
D176531	4.3	115	70	700	2	N	15	70	15	100 L

Sample	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D176517	N	20	B	50	15	150	70	30	3	300
D176518	N	20	B	70	20	150	150	30	5	150
D176519	N	20 L	150 L	70	20	150	150	50	5	150
D176520	N	20 L	B	70	15	150	100	30	3	200
D176521	N	20 L	B	30	15	150	100	30	3	150
D176522	N	20 L	B	50	15	150	100	30	3	150
D176523	N	20 L	B	15	10 L	150	70	N	2 N	50
D176524	N	20 L	B	70	15	150	150	30		3 150
D176525	N	20 L	N	50	15	150	150	30		3 150
D176526	10	20 L	B	15	10 L	70	50	20	L	2 200
D176527	N	20	N	30	15	150	150	30		3 200
D176528	N	20	N	50	15	150	150	50		5 150
D176529	N	15 L	B	20	10	50	70	50		B 70
D176530	N	15	N	50	15	150	150	20		2 150
D176531	N	15	N	70	15	150	150	20		2 150

Sample	Total C%	Orgnc C%	Crbnt C%	Total S%
D176517	1.60	0.8	0.75	0.10
D176518	1.78	.7	1.12	.71
D176519	4.36	4.0	.36	.47
D176520	2.32	.6	1.74	.24
D176521	2.37	.6	1.73	.10L
D176522	2.43	.6	1.80	.10L
D176523	8.85	.2	8.68	.10L
D176524	2.02	.6	1.42	.10L
D176525	2.98	1.8	1.19	.10
D176526	1.36	1.2	.16	.10L
D176527	2.42	1.2	1.23	.13
D176528	3.48	3.0	.50	.22
D176529	7.54	.9	6.68	.10L
D176530	7.65	7.6	.04	.13
D176531	9.85	9.5	.33	.12

Table 7a.--Content of seven trace elements in 16 coal samples from USGS core hole RM-1, SW 1/4 NW 1/4 sec. 33, T. 56 N., R. 72 W., Campbell County, Wyo.

[Analyses on air-dried (32°C) coal. All values are in parts per million. L after a value means less than the value shown]

Anderson coal bed 148.2 to 185.0 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D176630	148.2 - 149.0	2	50	0.07	0.2	0.7	2.8	0.5
D176631	149.0 - 157.0	1	50	.09	.2	.5	3.0L	.3
D176632	157.0 - 162.0	1L	55	.10	.1	.6	3.1	.2
D176633	162.0 - 166.1	1L	45	.20	.2	1.1	2.1	.3
D176634	166.1 - 167.0	1L	20L	.07	.1L	.4	3.0L	.3
D176635	167.0 - 172.5	1	50	.12	.1L	1.0	3.0L	.2
D176636	172.5 - 175.0	1	40	.08	.1L	.5	3.0L	.2
D176637	175.0 - 177.4	2	40	.08	.4	.9	5.5	.7
D176638	177.4 - 181.0	2	110	.21	.9	1.3	9.2	2.8
D176639	181.0 - 185.0	8	90	.21	1.7	1.9	16.2	4.8
Canyon A coal bed 187.8 to 210.3 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D176640	187.8 - 192.0	4	80	0.13	0.4	1.3	8.4	1.6
D176641	195.0 - 198.0	1	45	.06	.1	.6	3.0L	.4
D176642	198.0 - 202.0	1	70	.05	.2	.5	3.0L	.2L
D176643	202.0 - 204.9	1	85	.08	.1L	.4	5.0	.2L
D176644	204.9 - 207.9	1	45	.07	.2	.6	3.5	.6
D176645	207.9 - 210.3	2	60	.14	1.0	.8	10.7	2.0

Table 7b.--Content of seven trace elements in 11 coal samples from USGS core hole RM-2, SW 1/4 SW 1/4 sec. 25, T. 56 N., R. 73 W., Campbell County, Wyo.

[Analyses on air-dried (32°C) coal. All values are in parts per million. L after a value means less than the value shown]

Anderson coal bed 198.4 to 232.6 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D177704	198.4 - 199.1	5.0	60	0.06	0.7	1.1	3.0L	1.6
D177705	199.1 - 208.1	1.0	95	.10	.2	1.0	3.0L	.6
D177706	211.0 - 219.0	.5	65	.09	.1L	.8	3.0L	.2L
D177707	224.9 - 232.6	1.0	150	.11	.5	1.0	3.0L	1.9
Canyon A coal bed 236.5 to 265.2 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D177708	236.5 - 243.0	3.5	150	0.12	1.0	1.4	8.5	4.1
D177709	243.0 - 246.4	4.5	90	.15	.9	2.9	6.7	5.0
D177710	249.8 - 256.2	1.5	40	.03	.1L	.7	3.0L	.2L
D177711	258.2 - 265.2	1.5	35	.09	.2	.4	3.0L	.8
Canyon B coal bed 311.2 to 330.6 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D177712	311.2 - 313.0	1.5	30	0.06	0.2	0.7	3.0L	0.5
D177713	313.0 - 323.0	1.0	40	.06	.1L	.3	3.0L	.2L
D177714	324.0 - 330.6	1.0	65	.03	.1	.5	3.0L	.5

Table 7c.--Content of seven trace elements in 15 coal samples from USGS core hole RM-3, NW 1/4 NW 1/4 sec. 25, T. 56 N., R. 73 W., Campbell County, Wyo.

[Analyses on air-dried (32°C) coal. All values are in parts per million. L after a value means less than the value shown]

Anderson coal bed 92.5 to 124.5 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D176502	92.5 - 95.3	2	60	0.09	0.5	1.2	6.2	1.5
D176503	95.3 - 97.3	1	20L	.05	.2	.8	3.0L	.4
D176504	97.3 - 99.5	1	75	.08	.2	1.1	3.0L	.7
D176505	99.5 - 102.5	1	20L	.21	.5	2.5	6.6	1.6
D176506	102.5 - 105.3	1	30	.05	.1	.8	3.0L	.5
D176507	105.3 - 107.1	1	20L	.12	.1	.8	3.0L	.2L
D176508	107.1 - 110.5	1	20L	.13	.1	1.2	3.0L	.5
D176509	110.5 - 112.0	1L	20L	.07	.1	.9	3 0L	.2L
D176510	112.0 - 114.5	1L	25	.10	.1	.9	3.0L	11L
D176511	114.5 - 116.5	1	20L	.13	.1	.7	3.0L	.2L
D176512	116.5 - 118.5	1	25	.13	.2	.8	3.0L	.4
D176513	118.5 - 120.5	1	20	.08	.1	1.0	3.0L	.5
D176514	120.5 - 122.5	2	20	.05	.2	1.0	3.0L	.3
D176515	122.5 - 123.9	2	140	.18	.7	3.7	12.4	1.7
D176616	123.9 - 124.5	4	165	.21	2.1	2.7	17.8	8.3

Table 7d.--Content of seven trace elements in 21 coal samples from USGS core hole RM-4, SW 1/4 SW 1/4 sec. 25, T. 56 N., R. 73 W., Campbell County, Wyo.

[Analyses on air-dried (32°C) coal. All values are in parts per million. L after a value means less than the value shown]

Anderson coal bed 129.4 to 167.0 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D176799	129.4 - 130.0	3	25	0.02	0.8	0.8	3.0L	0.9
D176800	130.0 - 136.4	1	40	.03	.1	1.1	3.0L	.5
D176801	136.4 - 143.0	1	45	.08	.2	1.4	9.5	.4
D176802	143.0 - 148.9	1	30	.05	.1L	.8	3.0L	.2
D176803	148.9 - 156.7	1	50	.23	.1L	1.2	3.0L	.2
D176804	156.7 - 163.0	1	40	.08	.1L	.7	2.2	.2
D176805	163.0 - 167.0	4	100	.07	.8	2.1	15.1	2.8
Canyon A coal bed 298.0 to 320.5 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D176806	298.0 - 299.0	20	40	0.34	1.5	2.4	3.9	1.3
D176807	299.0 - 303.0	3	65	.09	.3	.8	3.0L	.9
D176808	305.0 - 306.0	2	70	.09	.6	1.1	7.1	.8
D176809	306.0 - 308.4	1	65	.04	.1L	.7	2.7	.3
D176810	308.4 - 312.0	1	40	.08	.1L	.6	2.3	.2
D176811	312.0 - 316.0	1	55	.03	.2	.4	5.8	.3
D176812	316.0 - 320.5	1	55	.03	.3	.5	3.0L	.8
Canyon B coal bed 323.0 to 349.0 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D176813	323.0 - 327.0	2	40	0.04	0.2	0.9	2.8	1.0
D176814	327.0 - 332.3	1	45	.03	.2	.7	4.6	.2L
D176815	332.3 - 335.3	1	40	.02	.2	.5	4.8	.8
D176816	335.3 - 338.4	1	25	.02	.2	.6	3.0L	.2L
D176817	338.4 - 342.0	1	25	.01L	.1L	.4	3.0L	.2L
D176818	342.0 - 346.0	3	70	.03	.4	1.2	7.8	1.3
D176819	346.0 - 349.0	2	80	.06	.4	.9	4.8	1.4

Table 7e.--Content of seven trace elements in 15 coal samples from USGS core hole RM-5, SE 1/4 SE 1/4 sec. 27, T. 56 N., R. 73 W., Campbell County, Wyo.

[Analyses on air-dried (32°C) coal. All values are in parts per million. L after a value means less than the value shown]

Anderson coal bed 135.2 to 168.6 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D177715	135.2 - 136.2	5.0	65	0.23	0.7	0.8	3.0L	1.9
D177716	136.2 - 140.0	1.0	40	.04	.2	.8	3.0L	.7
D177717	140.0 - 149.0	4.0	60	.13	.2	1.4	3.0L	1.6
D177718	149.0 - 157.2	.5	55	.06	.1L	.9	3.0L	.2L
D177719	157.2 - 165.6	1.0	20	.09	.1L	.7	3.0L	.2L
D177720	165.6 - 168.6	2.0	130	.17	1.6	2.3	13.6	7.6
Canyon coal bed 354.9 to 395.5 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D177721	354.9 - 356.4	18.0	20L	0.30	0.8	0.7	3.0L	0.7
D177722	356.5 - 360.0	2.0	20	.06	.2	1.0	3.0L	.6
D177723	360.0 - 361.8	3.5	220	.06	.5	1.0	3.0L	5.1
D177724	361.8 - 370.7	2.0	20L	.06	.1L	.6	3.0L	.4
D177725	371.1 - 374.8	1.0	65	.04	.3	.5	3.0L	1.2
D177726	374.8 - 375.9	5.5	433	.32	.7	1.8	15.8	4.9
D177727	375.9 - 384.3	1.0	25	.03	.2	.3	3.0L	.3
D177728	384.3 - 392.2	1.5	20L	.03	.2	.5	3.0L	.4
D177729	392.2 - 395.5	5.5	100	.25	.7	1.1	3.0L	2.9

Table 7f.--Content of seven trace elements in 11 coal samples from USGS core hole RM-6, NW 1/4 NE 1/4 sec. 21, T. 56 N., R. 73 W., Campbell County, Wyo.

[Analyses on air-dried (32°C) coal. All values are in parts per million. L after a value means less than the value shown]

Anderson coal bed 88.9 to 120.0 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D177730	88.9 - 90.4	1.5	30	0.03	0.4	0.8	3.0L	1.2
D177731	90.4 - 97.7	2.0	60	.08	.5	1.6	3.0L	2.2
D177732	97.7 - 107.4	5.0	65	.24	.3	2.2	3.0L	1.9
D177733	107.4 - 116.9	1.0	20	.05	.1	.7	3.0L	.2L
D177734	116.9 - 120.0	1.0	75	.04	.3	2.0	3.0L	1.2
Canyon coal bed 256.5 to 302.7 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D177735	256.5 - 257.2	9.0	215	0.07	2.1	0.9	3.0L	3.7
D177736	257.2 - 261.2	2.6	70	.3	.3	.8	3.0L	1.4
D177737	272.1 - 272.7	145.0	365	.33	1.0	3.2	3.0L	6.3
D177738	272.7 - 285.2	2.0	90	.12	.3	1.8	4.8	1.3
D177739	285.2 - 297.9	.5	50	.04	.2	.9	3.0L	.4
D177740	297.9 - 302.7	.5	25	.03	.2	.7	3.0L	.7

Table 7g.--Content of seven trace elements in 13 coal samples from USGS core hole RM-7, NE 1/4 NW 1/4 sec. 26, T. 55 N., R. 73 W., Campbell County, Wyo.

[Analyses on air-dried (32°C) coal. All values are in parts per million. L after a value means less than the value shown]

Anderson coal bed 133.2 to 170.3 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D177741	133.2 - 134.0	1.0	40	0.03	0.9	1.8	3.0L	0.7
D177742	134.0 - 141.0	.5	35	.05	.1L	1.0	3.0L	.2L
D177743	141.0 - 154.0	.5	50	.09	.2	1.1	3.0L	.6
D177744	154.0 - 161.9	.5	70	.07	.1L	1.1	3.0L	.2L
D177745	161.9 - 170.3	1.0	50	.05	.5	1.1	3.0L	1.8
Canyon coal bed 286.2 to 329.6 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D177746	286.2 - 287.3	31.0	85	0.50	2.9	1.6	5.9	1.6
D177747	287.3 - 297.3	3.5	45	.10	.1	1.1	3.0L	.2L
D177748	299.2 - 306.3	.5	20L	.06	.1L	.6	3.0L	.2L
D177749	306.3 - 317.7	1.0	45	.04	.1L	.6	3.0L	.2L
D177750	317.7 - 326.0	2.5	35	.09	.1L	.8	3.0L	.2L
D177751	326.0 - 329.6	2.0	100	.09	1.0	1.2	7.1	3.0
Cook coal bed 369.6 to 382.0 feet								
Sample	Depth	As	F	Hg	Sb	Se	Th	U
D177752	369.6 - 370.8	2.5	325	0.22	0.8	1.9	15.1	3.6
D177753	370.8 - 382.0	1.0	30	.06	.2	.8	3.0L	1.0

Table 8a.--Major, minor, and trace element composition of 10 samples from Anderson coal bed, USGS core hole RM-1 SW 1/4 NW 1/4 Sec. 33, T. 56 N., R. 72 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D176630	148.2 - 149.0	2.2	0.58	1.5	0.270	0.134	0.10	0.31	12	0.032	48 L
D176631	149.0 - 157.0	.36	.34	1.6	.258	.130	.023	.27	8.7	.020	37
D176632	157.0 - 162.0	.41	.38	1.5	.249	.132	.016	.26	8.2	.029	80
D176633	162.0 - 166.1	1.1	.42	1.4	.260	.127	.024	.24	6.4	.064	66
D176634	166.1 - 167.0	.43	.37	1.4	.243	.124	.016	.22	7.4	.020	26 L
D176635	167.0 - 172.5	.60	.37	1.5	.257	.126	.017	.22	8.7	.035	120
D176636	172.5 - 175.0	.28	.28	1.2	.221	.132	.013	.26	17	.018	65
D176637	175.0 - 177.4	.48	.60	1.1	.184	.106	.023	.22	11	.028	670
D176638	177.4 - 181.0	2.8	2.2	1.5	.285	.122	.088	.33	8.0	.098	1200
D176639	181.0 - 185.0	4.2	2.2	1.6	.337	.116	.13	.68	12	12	740

SAMPLE	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm	Th ppm
D176630	2	0.11 L	6.2	50	0.07	1.3	2.8 L	0.2	0.7	2.8
D176631	1	.06 L	7.8	50	.09	.6 L	1.5 L	.2	.5	3.0 L
D176632	1 L	.06 L	8.3	55	.10	1.3	1.6 L	.1	.6	3.1
D176633	1 L	.07 L	16.3	45	.20	1.7	1.9 L	.2	1.1	2.1
D176634	1 L	.06 L	5.5	20 L	.07	.8	1.5 L	.1 L	.4	3.0 L
D176635	1	.07 L	9.1	50	.12	1.3	1.7 L	.1 L	1.0	3.0 L
D176636	1	.05 L	4.7	40	.08	.5 L	1.3 L	.1 L	.5	3.0 L
D176637	2	.06 L	9.7	40	.08	4.2	1.5 L	.4	.9	5.5
D176638	2	.16 L	21.0	110	.21	22.7	4.8	.9	1.3	9.2
D176639	8	.42	26.8	90	.21	17.7	5.2 L	1.7	1.9	16.2

SAMPLE	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S
D176630	0.5	7.4	30	300	0.3	N	1.5	7	2	N
D176631	.3	2.9	50	500	N	N	1.5	5	1.5	N
D176632	.2	1.8	30	300	N	N	1	2	1.5	N
D176633	.3	3.0	20	200	N	N	1	3	1.5	N
D176634	.3	3.3	50	500	N	N	1	5	1	N
D176635	.2	2.7	30	500	N	30 L	1	3	1	N
D176636	.2	2.1	30	300	N	N	.7	3	.7	N
D176637	.7	1.3	30	300	.2	N	1.5	10	2	N
D176638	2.8	16.6	20	500	1	N	2	20	7	N
D176639	4.8	62.8	50	700	2	100 L	5	30	7	N

SAMPLE	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-B	Yb ppm-S	Zr ppm-S
D176630	10 L	0.7	2 L	N	2	1.5	70	15	5	0.5	15
D176631	N	.7	1.5 L	B	2	1.5	100	10	2	.2	10
D176632	7 L	.5	1.5 L	N	1.5	1.5	100	15	2	.2	10
D176633	7 L	N	1.5 L	N	1.5	1.5	50	15	2	.2	10
D176634	N	.5	1 L	B	1.5	1	100	10	1.5	.15	10
D176635	7 L	.5	1.5 L	N	2	1.5	150	10	2	.2	10
D176636	5 L	.7	1 L	N	1.5	1	100	7	1.5	15	7
D176637	7	3	1.5 L	N	5	2	100	20	5	.3	10
D176638	15 L	2	3	N	7	5	150	50	10	.7	30
D176639	20	7	5	30	15	10	150	100	15	1.5	50

Table 8b.--Major, minor, and trace element composition of 6 samples from Canyon A coal bed, USGS core hole RM-1 SW 1/4 NW 1/4 Sec. 33, T. 56 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D176640	187.8 - 192.0	1.6	0.96	1.5	0.287	0.134	0.058	0.26	7.8	0.071	1094
D176641	195.0 - 198.0	.45	.21	1.4	.268	.122	.016	.23	17	.015	44
D176642	198.0 - 202.0	.13	.16	1.0	.258	.113	.013	.20	18	.010	36
D176643	202.0 - 204.9	.33	.34	1.3	.268	.111	.023	.22	5.7	.014	275
D176644	204.9 - 207.9	.64	.45	1.4	.300	.112	.022	.21	6.5	.051	300
D176645	207.9 - 210.3	2.3	1.4	1.1	.269	.123	.11	.37	6.1	.052	67

SAMPLE	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm	Th ppm
D176640	4	0.11 L	15.9	80	0.13	5.3	2.8 L	0.4	1.3	8.4
D176641	1	.06 L	4.5	45	.06	.6 L	1.5 L	.1	.6	3.0 L
D176642	1	.05 L	3.3	70	.05	.5 L	1.2 L	.2	.5	3.0 L
D176643	1	.06 L	3.9	85	.08	.7	1.4 L	.1 L	.4	5.0
D176644	1	.07 L	16.8	45	.07	1.8	2.2	.2	.6	3.5
D176645	2	.18	18.2	60	.14	5.4	6.1	1.0	.8	10.7

SAMPLE	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S
D176640	1.6	19.9	30	300	0.3	50 L	1.5	10	3	N
D176641	.4	1.3	50	150	N	N	.7	1.5	.7	N
D176642	.2 L	1.3	30	150	N	N	.7	1.5	.7	N
D176643	.2 L	2.5	50	500	N	N	1	1.5	1	N
D176644	.6	2.2	50	200	N	N	1	5	1.5	2
D176645	2.0	22.3	30	150	2	70 L	2	15	7	N

SAMPLE	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-B	Yb ppm-S	Zr ppm-S
D176640	15	2	2	20	5	3	100	30	10	0.7	15
D176641	N	.5	1 L	B	1.5	1	70	5	3	.15	10
D176642	N	.3	1 L	B	1.5	.7	100	.7	1.5	.15	7
D176643	N	.5	1 L	B	1.5	1	100	10	3	.15	10
D176644	7 L	.7	1.5 L	N	2	2	100	20	5	.3	10
D176645	15 L	2	2	N	3	3	30	30	10	1	20

Table 8c.—Major, minor, and trace element composition of 4 samples from Anderson coal bed, USGS core hole RM-2 SW 1/4 NW 1/4 Sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D177704	194.4 - 199.1	4.8	0.83	1.1	0.294	0.134	0.15	0.37	68 L	0.060	770 L
D177705	199.1 - 208.1	1.3	.45	1.2	.279	.137	.030	.19	34 L	.065	380 L
D177706	211.0 - 219.0	.71	.34	1.1	.277	.138	.009	.15	26 L	.041	300 L
D177707	224.9 - 232.6	3.0	1.8	.99	.296	.134	.11	.26	60 L	.086	680 L

SAMPLE	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D177704	0.035 L	5.0	0.18 L	10.6	60	0.06	2.6	4.4 L	0.7	1.1
D177705	.017 L	1.0	.09 L	16.4	95	.10	1.5	2.6	.2	1.0
D177706	.014 L	.5	.07 L	9.8	65	.09	1.0	2.4	.1 L	.8
D177707	.031 L	1.0	.16 L	19.3	150	.11	7.6	5.5	.5	1.0

SAMPLE	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S
D177704	3.0 L	1.6	20.1	50	500	3	3	15	10	3 L
D177705	3.0 L	.6	4.5	70	700	N	1.5	5	2	N
D177706	3.0 L	.2 L	3.2	50	500	N	1	3	2	N
D177707	3.0 L	1.9	20.7	50	500	.7	2	20	10	N

SAMPLE	Mo ppm-S	Nb ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177704	1.5	10	5	5	150	50	15	3	30
D177705	.7	1.5	1.5	1.5	150	15	5	.7	15
D177706	.5	N	1.5	1.5	100	15	2	.3	10
D177707	1.5	N	5	5	100	50	7	1	20

Table 8d.—Major, minor, and trace element composition of 4 samples from Canyon A coal bed, USGS core hole RM-2 SW 1/4 SW 1/4 Sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D177708	236.5 - 243.0	6.4	2.9	0.92	0.328	0.126	.022	0.51	100 L	0.15	1100 L
D177709	243.0 - 246.4	4.2	2.4	.85	.294	.121	.070	.34	84 L	.14	940 L
D177710	249.8 - 256.2	.30	.25	.96	.266	.126	.009	.27	31	.021	250 L
D177711	258.2 - 265.2	.60	.38	.85	.257	.115	.013	.14	24 L	.025	270 L

SAMPLE	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D177708	0.054 L	3.5	0.27 L	32.5	150	0.12	16.1	10.8	1.0	1.4
D177709	.043 L	4.5	.22	53.1	90	.15	27.4	11.9	.9	2.9
D177710	.011 L	1.5	.06 L	5.7	40	.03	.6 L	1.4 L	.1 L	.7
D177711	.012 L	1.5	.06 L	10.2	35	.09	1.0	3.1	.2	.4

SAMPLE	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	La ppm-S
D177708	8.5	4.1	38.7	50	700	2	5	50	15	30 L
D177709	6.7	5.0	84.9	50	700	1.5	3	15	10	20 L
D177710	3.0 L	.2 L	2.8	70	500	N	.7	3	1	N
D177711	3.0 L	.8	1.8	70	300	1	1	5	2	N

SAMPLE	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177708	5	5	N	15	5	500	70	20	2	30
D177709	7	5	30	15	5	500	70	15	2	30
D177710	.5	N	B	1.5	1	100	10	1.5	.15	7
D177711	.7	1.5	B	3	2	100	20	5	.5	10

Table 8e.—Major, minor, and trace element composition of 3 samples from Canyon B coal bed, USGS core hole RM-2 SW 1/4 SW 1/4 Sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D177712	311.3 - 313.0	0.44	0.32	0.90	0.339	0.098	0.010	0.34	28 L	0.013	320 L
D177713	313.0 - 323.0	.36	.20	.98	.306	.108	.007	.62	61	.015	520
D177714	324.0 - 330.6	.73	.49	.87	.249	.122	.021	.28	32	.022	790

SAMPLE	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D177712	0.015 L	1.5	0.07 L	4.2	30	0.06	0.07 L	1.8	0.2	0.7
D177713	.014 L	1.0	.07 L	2.6	40	.06	.7 L	1.8 L	.1 L	.3
D177714	.015 L	1.0	.07 L	5.7	65	.03	1.4	3.8	.1	.5

SAMPLE	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S
D177712	3.0 L	0.5	1.5	70	300	3	5	5	3	7
D177713	3.0 L	.2 L	2.2	70	700	N	.7 L	1.5	1	N
D177714	3.0 L	.5	2.6	70	700	.2	1	5	2	N

SAMPLE	La ppm-S	Mo ppm-S	Nb ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-B	Yb ppm-S	Zr ppm-S
D177712	N	0.5	1.5	7	1.5	70	7	7	0.7	7
D177713	N	.5	N	1.5	N	150	5	1.5	B	7
D177714	7 L	.7	1.5	3	1	150	10	5	.3	7

Table 8f.—Major, minor, and trace element composition of 15 samples from Anderson coal bed, USGS core hole RM-3 NW 1/4 NW 1/4 Sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D176502	992.5 - 95.3	3.8	0.95	1.8	0.370	0.077	0.15	0.45	56	0.080	720
D176503	95.3 - 97.3	.76	.56	1.7	.317	.077	.047	.31	52	.027	750
D176504	97.3 - 99.5	.91	.64	1.8	.334	.089	.022	.29	64	.038	790
D176505	99.5 - 102.5	2.5	1.6	2.0	.365	.102	036	.34	74	.14	2200
D176506	102.5 - 105.3	.37	.43	1.7	.288	.113	.012	.26	57	.027	720
D176507	105.3 - 107.1	.52	.54	1.9	.320	.122	.011	.26	67	.038	1500
D176508	107.1 - 110.5	.60	.42	1.8	.316	.122	.010	.26	67	.046	850
D176509	110.5 - 112.0	.20	.31	1.5	.266	.133	.009	.25	50	.024	830
D176510	112.0 - 114.5	.49	.38	1.7	.298	.131	.010	.20	63	.021	890
D176511	114.5 - 116.5	.63	.37	1.8	.320	.139	.010	.26	67	.026	870
D176512	116.5 - 118.5	.50	.38	1.7	.306	.147	.012	.26	61	.038	820
D176513	118.5 - 120.5	.50	.39	1.7	.304	.152	.010	.24	60	.027	1000
D176514	120.5 - 122.5	.18	.37	1.6	.302	.145	.009	.25	54	.019	740
D176515	122.5 - 123.9	5.5	3.6	1.6	.445	.161	.28	.58	55	.14	1400
D176516	123.9 - 124.5	8.7	5.4	1.0	.414	.150	.42	.82	35	.19	390

SAMPLE	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm	Th ppm
D176502	2	0.16 L	19.4	60	0.09	3.2 L	4.0 L	0.5	1.2	6.2
D176503	1	.08 L	9.7	20 L	.05	1.6 L	2.0 L	.2	.8	3.0 L
D176504	1	.09 L	11.0	75	.08	4.1	2.2	.2	1.1	3.0 L
D176505	1	.15 L	36.3	20 L	.21	17.2	4.5	.5	2.5	6.6
D176506	1	.07 L	9.6	30	.05	2.2	1.7 L	.1	.8	3.0 L
D176507	1	.08 L	12.2	20 L	.12	2.5	1.9 L	.1	.8	3.0 L
D176508	1	.07 L	16.0	20 L	.13	2.8	1.9 L	.1	1.2	3.0 L
D176509	1 L	.06 L	7.3	20 L	.07	1.2 L	1.4 L	.1	.9	3.0 L
D176510	1 L	.07 L	6.2	25	.10	1.3	1.7 L	.1	.9	3.0 L
D176511	1	.07 L	7.0	20 L	.13	1.5	1.8 L	.1	.7	3.0 L
D176512	1	.07 L	10.6	25	.13	1.4 L	2.8	.2	.8	3.0 L
D176513	1	.07 L	8.8	20	.08	1.4 L	1.8	.1	1.0	3.0 L
D176514	2	.07 L	6.1	20	.05	1.3 L	1.3	.2	1.0	3.0 L
D176515	2	.26 L	48.4	140	.18	12.2	7.8	.7	3.7	12.4
D176516	4	.37	52.0	165	.21	23.4	20.1	2.1	2.7	17.8

Table 8f.--Major, minor, and trace element composition of 15 samples from Anderson coal bed, USGS core hole RM-3 NW 1/4 NW 1/4 Sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis.-Continued

SAMPLE	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Cr ppm-S	Ca ppm-S
D176502	1.5	12.3	50	300	N	N	2	10	5
D176503	.4	2.6	50	500	N	N	1	5	2
D176504	.7	3.1	70	500	N	N	1.5	7	2
D176505	1.6	4.2	50	1000	N	70 L	2	10	7
D176506	.5	4.3	70	500	N	N	1.5	3	2
D176507	.2 L	2.3	50	700	N	N	1	2	2
D176508	.5	3.1	50	500	N	N	1	2	1
D176509	.2 L	1.7	70	500	N	N	1	1.5	1.5
D176510	.2 L	4.5	50	700	N	N	1	3	1
D176511	.2 L	2.1	50	500	N	N	1	2	1
D176512	.4	1.8	50	500	N	N	1	3	1
D176513	.5	3.7	50	700	N	N	1	3	1.5
D176514	.3	9.9	50	500	N	N	2	5	2
D176515	1.7	14.3	50	700	.7	N	5	50	15
D176516	8.3	89.3	50	300	2	N	5	50	20

SAMPLE	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-B	Yb ppm-S	Zr ppm-S
D176502	15 L	1	5	N	3	3	100	20	10	1	50
D176503	7 L	.7	1.5 L	N	2	1	70	10	2	.5	10
D176504	N	.7	1.5 L	B	2	1.5	100	15	2	.7	15
D176505	15	1	5	20 L	3	5	150	50	5	.7	30
D176506	N	2	1.5 L	B	3	2	100	20	2	.3	10
D176507	7 L	N	1.5 L	N	2	2	200	15	2	.5	10
D176508	N	2	1.5	B	2	1.5	100	15	2	.2	15
D176509	N	1	1 L	B	1.5	1	100	10	1.5	.15	10
D176510	N	1	1.5 L	B	2	2	150	10	2	.2	10
D176511	N	.5	1.5 L	B	2	1.5	100	10	2	.2	10
D176512	N	1	1.5 L	B	2	1	100	10	2	.2	10
D176513	7 L	1.5	1.5 L	N	3	1	150	10	2	.2	10
D176514	N	3	1.5 L	B	5	1	100	10	3	.2	10
D176515	20	5	7	50 L	7	7	500	150	15	1.5	50
D176516	30 L	5	10	50 L	10	10	100	100	20	2	70

Table 8g.--Major, minor, and trace element composition of 7 samples from Anderson coal bed, USGS core hole RM-4 SW 1/4 SW 1/4 Sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D176799	129.4 - 130.0	0.92	0.37	1.1	0.326	0.160	0.027	0.24	31 L	0.046	350 L
D176800	130.0 - 136.4	.65	.49	1.1	.347	.164	.028	.25	29 L	.039	320 L
D176801	136.4 - 143.0	.69	.60	1.1	.328	.166	.010	.23	31 L	.075	340 L
D176802	143.0 - 148.9	.62	.49	1.1	.326	.157	.009	.22	27 L	.053	300 L
D176803	148.9 - 156.7	.65	.45	1.1	.328	.164	.009	.20	27 L	.072	300 L
D176804	156.7 - 163.0	.050	.37	1.0	.311	.165	.007	.18	25 L	.033	5700
D176805	163.0 - 167.0	4.0	2.6	.83	.379	.141	.17	.48	79 L	.13	890 L

SAMPLE	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D176799	0.016 L	3	0.08 L	4.4	25	0.02	0.8 L	2.0	0.8	0.8
D176800	.015 L	1	.07	8.2	40	.03	.9	2.6	.1	1.1
D176801	.016 L	1	.08 L	17.0	45	.08	3.2	3.6	.2	1.4
D176802	.014 L	1	.07	10.8	30	.05	2.3	2.4	.1 L	.8
D176803	.014 L	1	.07	14.6	50	.23	1.4	2.4	.1 L	1.2
D176804	.013 L	1	.07 L	6.6	40	.08	.7 L	1.6	.1 L	.7
D176805	.041 L	4	.20 L	23.9	100	.07	10.0	6.1	.8	2.1

SAMPLE	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S
D176799	3.0 L	0.9	7.8	50	200	1.5	N	1	7	B	2
D176800	3.0 L	.5	8.6	50	300	N	N	1	5	1.5	N
D176801	9.5	.4	10.1	50	500	N	N	1	5	2	N
D176802	3.0 L	.2	4.0	50	300	N	N	1	2	1	N
D176803	3.0 L	.2	10.6	30	300	N	N	1	2	1	N
D176804	2.2	.2	9.0	50	500	N	N	1	2	1	N
D176805	15.1	2.8	55.3	50	300	1.5	100 L	3	20	7	N

SAMPLE	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-B	Yb ppm-S	Zr ppm-S
D176799	N	1	5	B	2	5	50	50	10	1	20
D176800	N	1	1.5 L	B	2	1	50	10	2	.2	10
D176801	7 L	1	2	N	2	1.5	50	20	2	.2	15
D176802	N	N	1.5	B	1.5	1.5	50	10	2	.2	10
D176803	N	N	2	B	1.5	1	50	15	2	.2	15
D176804	7 L	1	1.5	N	2	1	50	7	2	.2	10
D176805	20 L	3	7	N	7	5	100	100	15	1	30

Table 8h.—Major, minor, and trace element composition of 7 samples from Canyon A coal bed, USGS core hole RM-4 SW 1/4 SW 1/4 Sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D176806	298.0 - 299.0	.39	.48	.88	.291	.140	.018	2.2	42 L	.028	640
D176807	299.0 - 303.0	1.8	.52	1.0	.301	.148	.024	.22	42 L	.13	470 L
D176808	305.0 - 306.0	1.9	.62	.84	.263	.151	.066	.47	40 L	.057	450 L
D176809	306.0 - 308.4	.18	.39	.97	.294	.171	.010	.19	23 L	.028	310
D176810	308.4 - 312.0	.31	.31	.93	.290	.168	.009	.43	43	.033	270 L
D176811	312.0 - 316.0	.58	.37	.88	.277	.157	.011	.19	23 L	.034	260 L
D176812	316.0 - 320.5	.46	.39	.87	.273	.161	.015	.20	22 L	.036	250 L

SAMPLE	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D176806	.022 L	20	.16	6.6	40	.34	1.1 L	2.7 L	1.5	2.4
D176807	.022 L	3	.11 L	13.1	65	.09	1.2	3.2	.3	.8
D176808	.021 L	2	.10 L	7.1	70	.09	1.0	2.6 L	.6	1.1
D176809	.012 L	1	.06 L	3.5	65	.04	.6 L	1.5	.1 L	.7
D176810	.012 L	1	.06 L	6.6	40	.08	.6 L	1.6 L	.1 L	.6
D176811	.012 L	1	.06 L	7.4	55	.03	.6 L	2.1	.2	.4
D176812	.011 L	1	.06 L	9.1	55	.03	.6	3.1	.3	.5

SAMPLE	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S
D176806	3.9	1.3	40.8	30	300	3	50 L	7	5	B	7
D176807	3.0 L	1.3	40.8	30	300	3	50 L	1	5	2	N
D176808	7.1	.8	41.4	30	300	1	50 L	2	7	7	N
D176809	2.7	.3	5.0	50	500	.5	N	1.5	1.5	1	N
D176810	2.3	.2	9.0	50	300	N	N	1	2	1	N
D176811	5.8	.3	8.7	50	500	.5	N	1	1.5	1	N
D176812	3.0 L	.8	8.9	50	500	.7	30 L	1	10	1.5	N

SAMPLE	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D176806	10 L	7	3	N	30	10	70	70	15	B	100
D176807	10 L	1.5	3	N	3	1.5	70	15	7	.7	20
D176808	10 L	.7	5	N	5	3	70	15	7	.7	30
D176809	7 L	.5	1 L	N	5	1	100	7	5	.5	7
D176810	N	.5	1.5	B	3	1	50	7	2	.3	10
D176811	7 L	.5	1.5	N	1.5	1	70	10	5	.5	10
D176812	10	1	1.5	10	1.5	1.5	70	15	7	.5	10

Table 81.—Major, minor, and trace element composition of 7 samples from Canyon B coal bed, USGS core hole RM-4 SW 1/4 SW 1/4 Sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D176813	323.0 - 327.0	1.5	.74	.90	.297	.140	.037	.25	34 L	.043	380 L
D176814	327.0 - 332.3	.22	.30	.89	.275	.155	.008	.40	80	.018	230 L
D176815	332.3 - 335.3	.36	.25	.87	.302	.141	.010	.97	180	.015	280 L
D176816	335.3 - 338.4	.37	.16	.81	.284	.148	.008	.74	140	.016	250 L
D176817	338.4 - 342.0	.14	.25	.84	.252	.152	.008	.15	17 L	.013	190 L
D176818	342.0 - 346.0	.81	.76	.80	.250	.142	.025	.27	30 L	.046	340 L
D176819	346.0 - 349.0	2.1	1.1	.83	.264	.135	.054	.24	45 L	.077	510 L

SAMPLE	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D176813	.018 L	2	.09 L	7.5	40	.04	2.3	4.0	.2	.9
D176814	.011 L	1	.05 L	1.5	45	.03	.5 L	1.6	.2	.7
D176815	.013 L	1	.06 L	2.9	40	.02	.6 L	1.6 L	.2	.5
D176816	.012 L	1	.06 L	1.9	25	.02	.6 L	1.4 L	.2	.6
D176817	.009 L	1	.04 L	2.3	25	.01 L	.4 L	1.3	.1 L	.4
D176818	.016 L	3	.08 L	9.4	70	.03	2.9	1.9 L	.4	1.2
D176819	.023 L	2	.12 L	16.8	80	.06	4.6	2.9	.4	.9

SAMPLE	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S
D176813	2.8	1.0	29.8	50	300	1.5	50 L	3	5	1.5	N
D176814	4.6	.2 L	7.5	30	300	N	N	.5	.7	.7	N
D176815	4.8	.8	13.9	50	200	.2	N	1	1	1	N
D176816	3.0 L	.2 L	3.8	30	300	N	N	.7 L	1	.7	N
D176817	3.0 L	.2 L	3.2	30	300	N	N	.7	.7	.5	N
D176818	7.8	1.3	5.8	50	200	.2	50	1.5	5	2	N
D176819	4.8	1.4	33.7	30	300	.7	70 L	1.5	7	2	N

SAMPLE	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-B	Yb ppm-S	Zr ppm-S
D176813	10 L	1	1.5	N	3	1.5	50	15	10	.7	15
D176814	N	.3	1.5	B	1	.5 L	50	3	1	.15	7
D176815	N	.5	1.5 L	B	2	.7	50	3	2	.5	5
D176816	N	.5	1 L	B	1.5	.7 L	50	1.5	1 L	.10 L	5
D176817	N	.3	1 L	B	2	.5	30	3	1.5	15	3
D176818	10	.7	2	15	5	1	50	15	5	.5	10
D176819	10 L	.7	2	N	7	2	70	20	7	.7	15

Table 8j.--Major, minor, and trace element composition of 6 samples from Anderson coal bed, USGS core hole RM-5 SE 1/4 SE 1/4 Sec. 27, T. 56 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D177715	135.2 - 136.2	4.1	0.75	1.0	0.280	0.144	0.14	0.51	67 L	0.050	750 L
D177716	136.2 - 140.0	1.4	.54	1.0	.257	.159	.055	.18	40	.036	400 L
D177717	140.0 - 149.0	.26	.16	.18	.043	.023	.005	.040	7.0 L	.014	79 L
D177718	149.0 - 157.2	.86	.44	1.2	.284	.158	.009	.17	38	.054	340 L
D177719	157.2 - 165.6	.54	.36	1.1	.284	.168	.009	.23	38	.035	310 L
D177720	165.6 - 168.6	4.3	2.4	1.0	.326	.168	.16	.39	84 L	.12	940 L

SAMPLE	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D177715	0.034 L	5.0	0.17 L	8.9	65	0.23	3.1	4.3	0.7	0.8
D177716	.018 L	1.0	.09 L	7.7	40	.04	1.4	2.3 L	.2	.8
D177717	.004 L	4.0	.02 L	3.3	60	.13	1.7	.7	.2	1.4
D177718	.016 L	.5	.08 L	10.9	55	.06	3.4	1.9	.1 L	.9
D177719	.014 L	1.0	.07 L	6.8	20	.09	1.2	1.8	.1 L	.7
D177720	.043 L	2.0	.22	31.8	130	.17	15.6	9.7	1.6	2.3

SAMPLE	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S
D177715	3.0 L	1.9	19.8	100	300	2	2	10	10	N
D177716	3.0 L	.7	5.2	100	300	N	1.5	7	3	N
D177717	3.0 L	1.6	1.1	15	100	N	.3	1.5	.5	N
D177718	3.0 L	.2 L	2.8	70	500	N	.7	5	2	N
D177719	3.0 L	.2 L	2.7	70500		N	.7	3	2	N
D177720	13.6	7.6	36.5	70	700	2	2	50	15	5

SAMPLE	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-B	Yb ppm-S	Zr ppm-S
D177715	N	2	5	B	5	3	100	50	10	1	30
D177716	N	1	N	B	2	1.5	100	20	5	.5	15
D177717	2 L	.2	.3	N	1	.3	20	5	1	.10	3
D177718	N	.5	1.5	B	1	1.5	150	15	5	.5	10
D177719	N	1	N	B	1.5	1	150	10	2	.2	7
D177720	30	10	7	30	7	7	100	100	30	3	30

Table 8k.--Major, minor, and trace element composition of 9 samples from Canyon coal bed, USGS core hole RM-5 SE 1/4 SE 1/4 Sec. 27, T. 56 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D177721	354.9 - 356.4	0.33	0.30	1.0	0.272	0.152	0.007	0.85	62	0.021	406 L
D177722	356.5 - 360.2	1.1	.43	1.1	.304	.155	.010	.16	62	.076	399
D177723	360.2 - 361.8	28	3.6	.42	.276	.106	.87	.35	274 L	.29	3085 L
D177724	361.8 - 370.7	.37	.32	.97	.274	.151	.007	.19	39	.024	391
D177725	371.1 - 374.8	1.9	.80	1.0	.293	.148	.068	.17	54	.064	454 L
D177726	374.8 - 375.9	3.7	1.4	.073	.085	.025	.18	.17	51 L	.055	572 L
D177727	375.9 - 384.3	.34	.29	1.1	.304	.139	.008	.18	63	.017	276
D177728	384.3 - 392.2	.24	.30	1.0	.278	.145	.007	.35	79	.017	453
D177729	-----	3.8	2.4	.90	.317	.137	.12	.60	104	.10	882

SAMPLE	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D177721	0.019 L	18	0.09 L	6.0	20 L	0.30	0.9	2.3 L	0.8	0.7
D177722	.018 L	2	.09 L	13.0	20	.06	2.2	3.1	.2	1.0
D177723	.14 L	4	.71 L	21.9	220	.06	21.9	17.7 L	.5	1.0
D177724	.012 L	2	.06 L	7.7	20 L	.06	.8	1.8	.1 L	.6
D177725	.021 L	1	.10 L	15.0	65	.04	3.5	3.1	.3	.5
D177726	.026 L	6	.13 L	6.0	433	.32	8.5	3.9	.7	1.8
D177727	.012 L	1	.06 L	3.1	25	.03	.8	1.5	.2	.3
D177728	.012 L	2	.06 L	2.8	20 L	.03	.6 L	1.5 L	.2	.5
D177729	.040 L	6	.20 L	24.4	100	.25	15.1	9.1	.7	1.1

SAMPLE	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S
D177721	3.0 L	0.7	6.0	70	500	2	N	1.5	3	N
D177722	3.0 L	.6	3.9	70	700	N	1	7	3	N
D177723	3.0 L	5.1	20.5	70	500	N	7 L	50	15	N
D177724	3.0 L	.4	2.4	70	700	.2	1.5	3	1.5	N
D177725	3.0 L	1.2	4.6	70	700	.5	1.5	10	5	N
D177726	15.8	4.9	24.8	15	100	N	3	15	7	N
D177727	3.0 L	.3	4.4	70	700	.15	1	1.5	1.5	N
D177728	3.0 L	.4	3.7	70	1000	N	.7	2	1	N
D177729	3.0 L	2.9	25.9	70	500	.7	7	20	15	N

SAMPLE	La ppm-S	Mo ppm-S	Nb ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177721	10 L	3	N	5	1.5	70	7	10	1	7
D177722	10 L	.7	3	3	1.5	150	20	7	.7	15
D177723	N	N	20	7 L	7	150	70	20	3	200
D177724	N	.7	N	2	1	200	10	3	.3	10
D177725	10 L	.7	3	2	3	100	30	7	.7	15
D177726	N	N	5	7	2	50	50	5	.5	20
D177727	7 L	.5	1	1.5	.7	100	5	3	.3	5
D177728	7	.7	N	2	.7	200	7	3	.3	5
D177729	20 L	3	7	20	3	100	70	15	1.5	30

Table 81.—Major, minor, and trace element composition of 5 samples from Anderson coal bed, USGS core hole RM-6 NW 1/4 NW 1/4 Sec. 21, T. 56 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D177730	88.9 - 90.4	1.5	0.70	1.0	0.238	0.153	0.071	0.18	48	0.042	420 L
D177731	90.4 - 97.7	1.6	1.1	1.2	.280	.168	.052	.28	56	.062	510 L
D177732	97.7 - 107.4	2.0	1.3	1.2	.292	.165	.043	.41	68	.11	590 L
D177733	107.4 - 116.9	1.2	.86	2.5	.588	.377	.013	.42	95	.069	670 L
D177734	116.9 - 120.0	1.7	1.1	1.1	.299	.181	.064	.22	56	.079	520 L

SAMPLE	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D177730	0.019 L	1.5	0.10 L	6.7	30	0.30	2.2	2.4	0.4	0.8
D177731	.023 L	2.0	.12 L	15.7	60	.08	5.5	4.6	.5	1.6
D177732	.027 L	5.0	.14 L	35.1	65	.24	12.8	4.7	.3	2.2
D177733	.031 L	1.0	.15 L	18.2	20	.05	4.3	3.8	.1	.7
D177734	.024 L	1.0	.12 L	19.2	75	.04	4.3	4.8	.3	2.0

SAMPLE	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S
D177730	3.0 L	1.2	8.6	100	500	1.5	1.5	10	7	N
D177731	3.0 L	2.2	4.9	70	700	N	1.5	15	7	N
D177732	3.0 L	1.9	27.9	70	700	N	2	15	7	N
D177733	3.0 L	.2 L	4.9	150	1000	N	1.5	7	5	N
D177734	3.0 L	1.2	4.3	70	700	.3	1	20	10	N

SAMPLE	La ppm-S	Mo ppm-S	Nb ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177730	N	5	2	3	3	100	30	10	1	15
D177731	10 L	1.5	2	3	3	100	30	7	.7	15
D177732	15 L	2	5	7	5	150	50	10	1	20
D177733	N	1	3	2	3	200	20	5	.5	15
D177734	10 L	2	3	2	2	100	70	10	1	20

Table 8m.--Major, minor, and trace element composition of 6 samples from Canyon coal bed, USGS core hole RM-6 NW 1/4 NE 1/4 Sec. 21, T. 56 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D177735	256.5 - 257.2	5.6	2.1	1.0	0.476	0.152	0.56	0.62	133	0.10	1034 L
D177736	257.2 - 261.2	1.5	1.3	1.0	.264	.157	.071	.23	63	.053	471 L
D177737	272.1 - 272.7	10	5.1	.83	.514	.164	.56	1.7	241	.18	1933 L
D177738	272.7 - 285.2	3.1	1.8	1.0	.310	.154	.13	.44	88	.087	681 L
D177739	285.2 - 297.9	.56	.27	1.2	.283	.148	.010	.37	105	.023	321
D177740	297.9 - 302.7	.40	.24	1.1	.262	.150	.010	.18	61	---	282

SAMPLE	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D177735	0.047 L	9	0.24 L	27.3	215	0.07	11.1	11.9	2.1	0.9
D177736	.022 L	3	.11 L	11.9	70	.05	5.7	4.3	.3	.8
D177737	.089 L	145	.44 L	37.7	365	.33	29.2	15.5	1.0	3.2
D177738	.031 L	2	.16 L	19.0	90	.12	10.1	6.2	.3	1.8
D177739	.014 L	1	.07 L	3.1	50	.04	.7	1.7 L	.2	.9
D177740	.012 L	1	.06 L	3.6	25	.03	.6 L	1.5	.2	.7

SAMPLE	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S
D177735	3.0 L	3.7	49.1	70	700	5	10	30	15	20
D177736	3.0 L	1.4	4.1	70	500	1.5	2	15	5	N
D177737	3.0 L	6.3	105	70	500	7	15	70	20	N
D177738	4.8	1.3	26.1	70	500	.5	2	15	5	N
D177739	3.0 L	.4	2.6	70	500	N	N	2	1	N
D177740	3.0 L	.7	2.5	70	700	.3	.7	5	1	N

SAMPLE	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177735	20 L	3	7	30	20	7	500	70	30	3	30
D177736	10 L	1	2	N	5	2	100	30	7	.7	15
D177737	N	7	10	B	30	10	200	150	30	3	70
D177738	15 L	1	3	N	7	3	200	50	7	1	20
D177739	N	.5	N	B	1	.7 L	150	5	2	.2	10
D177740	7	7	1	N	3	1	100	10	5	.5	7

Table 8n.--Major, minor, and trace element composition of 5 samples from Anderson coal bed, USGS core hole RM-7 NE 1/4 NW 1/4 Sec. 26, T. 55 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D177741	133.2 - 134.0	0.92	0.47	1.0	0.285	0.155	0.032	0.17	31	0.028	320 L
D177742	134.0 - 141.0	.72	.37	1.1	.290	.139	.015	.20	26 L	.029	300 L
D177743	141.0 - 154.0	.88	.47	1.1	.305	.141	.011	.17	29 L	.070	330 L
D177744	154.0 - 161.9	.57	.41	1.1	.312	.160	.009	.17	26 L	.028	290 L
D177745	161.9 - 170.3	.76	.65	.95	.290	.156	.026	.23	29 L	.028	330 L

SAMPLE	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D177741	0.015 L	1.0	0.07 L	11.2	40	0.03	1.1	2.2	0.9	1.8
D177742	.014 L	.5	.07 L	6.3	35	.05	.8	1.7	.1 L	1.0
D177743	.015 L	.5	.08 L	16.8	50	.09	2.4	2.3	.2	1.1
D177744	.013 L	.5	.07 L	6.6	70	.07	2.0	1.7	.1 L	1.1
D177745	.015 L	1.0	.07	10.6	50	.05	3.5	3.8	.5	1.1

SAMPLE	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S
D177741	3.0 L	.07	5.6	70	300	3	1	10	10	3
D177742	3.0 L	.2 L	2.0	70	500	.5	.7	3	1.5	N
D177743	3.0 L	.6	3.7	50	500	N	.7	5	2	N
D177744	3.0 L	.2 L	3.8	50	500	N	1	3	2	N
D177745	3.0 L	1.8	7.6	70	300	1	1	7	3	N

SAMPLE	La ppm-S	Mo ppm-S	Nb ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-B	Yb ppm-S	Zr ppm-S
D177741	N	1	5	1.5	7	70	50	10	1.5	20
D177742	N	N	N	1	1	100	10	5	.3	7
D177743	N	N	N	1	1.5	70	20	3	.3	10
D177744	7 L	N	N	1.5	2	150	15	2	.2	10
D177745	10	3	1.5	2	3	150	30	10	1	10

Table 8o.--Major, minor, and trace element composition of 6 samples from Canyon coal bed, USGS core hole RM-7 NE 1/4 NW 1/4 Sec. 26, T. 55 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

Canyon coal bed 286.2 to 329.6

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D177746	286.2 - 287.3	2.4	0.98	0.77	0.304	0.115	0.20	2.5	70 L	0.050	790 L
D177747	287.3 - 297.3	.74	.38	1.0	.309	.125	.012	.34	29 L	.047	380
D177748	299.2 - 306.3	1.4	.61	2.1	.621	.265	.020	.34	51 L	.062	570 L
D177749	306.3 - 317.7	.31	.25	.99	.286	.119	.007	.15	21 L	.016	360
D177750	317.7 - 326.0	.27	.30	.89	.261	.117	.008	.61	43	.018	510
D177751	326.0 - 329.6	3.6	2.1	.84	.298	.118	.12	.40	67 L	.11	760 L

SAMPLE	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D177746	0.036 L	31.0	0.18 L	14.6	85	0.50	4.2	4.6 L	2.9	1.6
D177747	.015 L	3.5	.08 L	8.7	45	.10	1.3	1.9	.1	1.1
D177748	.026 L	.5	.13 L	14.3	20 L	.06	2.1	3.9	.1 L	.6
D177749	.011 L	1.0	.05 L	2.0	45	.04	.5 L	1.3 L	.1 L	.6
D177750	.012 L	2.5	.06 L	3.8	35	.09	.6 L	1.5 L	.1 L	.8
D177751	.035 L	2.0	.17 L	24.0	100	.09	10.8	7.8	1.0	1.2

SAMPLE	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S
D177746	5.9	1.6	13.6	30	300	5	N	3	15	15
D177747	3.0 L	.2 L	2.0	50	500	.2	N	.7	5	2
D177748	3.0 L	.2 L	3.5	150	1000	N	N	1.5	7	5
D177749	3.0 L	.2 L	1.5	50	500	N	N	.5 L	1.5	1.5
D177750	3.0 L	.2 L	3.7	70	700	N	N	1	3	2
D177751	7.1	3.0	14.8	50	500	1.5	100 L	5	30	15

SAMPLE	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177746	20	N	5	3	10	5	50	50	15	1.5	30
D177747	N	N	N	N	1.5	1	100	15	2	.2	10
D177748	N	N	N	3	2	2	200	20	5	.5	20
D177749	N	N	N	1	.5	.5	150	3	1.5	.15	7
D177750	N	10	1	N	3	1	200	7	3	.3	7
D177751	N	15	2	10	10	5	150	150	15	1.5	50

Table 8p.—Major, minor, and trace element composition of 2 samples from Cook coal bed, USGS core hole RM-7 NE 1/4 NW 1/4 Sec. 26, T. 55 N., R. 73 W., Campbell County, Wyoming reported on a whole coal basis

[Values are in either percent or parts per million, Si, Al, Ca, Mg, Na, K, Fe, Mn, Ti, P, Cl, Cd, Cu, Li, Pb, and Zn values were calculated from analysis of ash. As, F, Hg, Sb, Se, Th, and U values are from direct determinations on air-dried (32°C) coal. The remaining analyses were calculated from spectrographic determinations on ash. L, less than value shown; N, not detected; B, not determined.]

SAMPLE	DEPTH	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
D177752	369.6 - 370.8	15	5.7	0.79	0.544	0.127	0.64	0.92	200 L	0.27	2300 L
D177753	370.8 - 382.0	1.3	.53	.99	.269	.113	.028	.21	32 L	.043	550

SAMPLE	Cl %	As ppm	Cd ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm
D177752	0.11 L	2.5	0.53 L	25.3	325	0.22	21.1	13.2	0.8	1.9
D177753	.017 L	1.0	.08 L	8.3	30	.06	2.0	2.1 L	.2	.8

SAMPLE	Th ppm	U ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	La ppm-S
D177752	15.1	3.6	60.2	70	500	5	5	70	30	50 L
D177753	3.0 L	1.0	3.8	100	700	.7	1.5	10	2	10

SAMPLE	Mo ppm-S	Nb ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-B	Yb ppm-S	Zr ppm-S
D177752	N	15	10	15	300	150	30	3	100
D177753	1.5	2	2	2	150	15	10	.7	15

Table 9a.--Major and minor oxide and trace element composition of the laboratory ash of 10 Anderson coal samples from USGS core hole RM-1, SW 1/4 NW 1/4 sec. 33, T. 56 N., R. 72 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

		Anderson coal bed 148.2 to 185.0 feet									
Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D176630	148.2 - 149.0	11.1	42	9.8	19	4.03	1.63	1.1	3.9	0.014	0.48
D176631	149.0 - 157.0	6.2	13	10	36	6.91	2.83	.45	6.1	.018	.55
D176632	157.0 - 162.0	6.3	14	11	33	6.56	2.83	.30	5.8	.017	.78
D176633	162.0 - 166.1	7.5	30	11	27	5.74	2.28	.39	4.6	.011	1.4
D176634	166.1 - 167.0	5.9	16	12	33	6.84	2.85	.32	5.4	.016	.56
D176635	167.0 - 172.5	6.7	19	10	31	6.36	2.54	.30	4.6	.017	.88
D176636	172.5 - 175.0	5.2	12	10	33	7.05	3.43	.31	7.1	.043	.56
D176637	175.0 - 177.4	6.2	17	18	24	4.93	2.31	.44	5.1	.023	.75
D176638	177.4 - 181.0	16.0	38	25	13	2.95	1.03	.66	2.9	.006	1.0
D176639	181.0 - 185.0	20.8	43	20	11	2.69	.76	.77	4.7	.008	.95

Sample	P_2O_5 %	SO_3 %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D176630	0.10 L	2.2	1.0L	56	12	25 L	67	300	3000	3
D176631	.14	5.5	1.0L	126	10 L	25 L	46	700	7000	N
D176632	.29	5.0	1.0L	132	20	25 L	29	500	5000	N
D176633	.20	4.7	1.0L	217	23	25 L	40	300	3000	N
D176634	.10 L	4.7	1.0L	93	14	25 L	56	700	7000	N
D176635	.42	3.7	1.0L	136	20	25 L	41	500	7000	N
D176636	.29	6.5	1.0L	91	10 L	25 L	41	700	7000	N
D176637	2.5	4.3	1.0L	156	67	25 L	21	500	5000	3
D176638	1.8	3.5	1.0L	131	142	30	104	150	3000	7
D176639	.81	4.2	2.0	129	85	25 L	302	200	3000	10

Table 9a.--Major and minor oxide and trace element composition of the laboratory ash of 10 Anderson coal samples from USGS core hole RM-1, SW 1/4 NW 1/4 sec. 33, T. 56 N., R. 72 W., Campbell County, Wyoming--Continued

Sample	Ce ppm	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S
D176630	N	15	70	20	N	100 L	7	20 L	N	20	15
D176631	N	20	70	20	N	N	10	20 L	B	30	20
D176632	N	15	30	20	N	100 L	7	20 L	N	20	20
D176633	N	15	50	20	N	100 L	N	20 L	N	20	20
D176634	N	15	70	15	N	N	7	20 L	B	30	20
D176635	500 L	15	50	15	N	100 L	7	20 L	N	30	20
D176636	N	15	70	15	N	100 L	15	20 L	N	30	20
D176637	N	20	150	30	N	100	50	20 L	N	70	30
D176638	N	15	150	50	N	100 L	15	20	N	50	30
D176639	500 L	20	150	30	N	100	30	20	150	70	50

Sample	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D176630	700	150	50	5	150
D176631	1500	150	30	3	150
D176632	1500	200	30	3	150
D176633	700	200	30	3	150
D176634	1500	150	30	3	150
D176635	2000	150	30	3	150
D176636	2000	150	30	3	150
D176637	1500	300	70	5	150
D176638	1000	300	70	5	200
D176639	700	500	70	7	200

Table 9b.--Major and minor oxide and trace element composition of the laboratory ash of 6 Anderson coal samples from USGS core hole RM-1, SW 1/4 NW 1/4 sec. 33, T. 56 N., R. 73 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

			Canyon A coal bed								
Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D176640	187.8 - 192.0	11.1	32	16	19	4.30	1.63	0.62	3.4	0.009	1.1
D176641	195.0 - 198.0	5.9	16	6.7	32	7.55	2.78	.32	5.6	.037	.44
D176642	198.0 - 202.0	5.0	5.5	6.1	28	8.58	3.04	.32	5.8	.046	.32
D176643	202.0 - 204.9	5.7	13	11	32	7.80	2.63	.48	5.5	.013	.42
D176644	204.9 - 207.9	7.2	19	12	27	6.91	2.11	.36	4.1	.012	1.2
D176645	207.9 - 210.3	12.3	39	21	13	3.64	1.35	1.1	4.3	.006	.71

Sample	P_2O_5 %	SO_3 %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D176640	2.3	6.5	1.0L	143	48	25 L	179	300	3000	3
D176641	.17	9.2	1.0L	76	10 L	25 L	22	700	3000	N
D176642	.16	6.1	1.0L	67	10 L	25 L	27	700	3000	N
D176643	1.1	6.1	1.0L	69	12	25 L	44	700	7000	N
D176644	.95	5.3	1.0L	233	25	30	31	700	3000	N
D176645	.12	5.0	1.5	148	44	50	181	300	1000	15

Table 9b.--Major and minor oxide and trace element composition of the laboratory ash of 6 Anderson coal samples from USGS core hole RM-1, SW 1/4 NW 1/4 sec. 33, T. 56 N., R. 73 W., Campbell County, Wyoming--Continued

Sample	Ce ppm	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S
D176640	500 L	15	100	30	N	150	20	20	200	50	30
D176641	N	10	30	10	N	N	7	20 L	B	30	15
D176642	N	15	30	15	N	N	7	20 L	N	30	15
D176643	N	15	30	15	N	N	7	20 L	N	30	20
D176644	N	15	70	20	30	100 L	10	20 L	N	30	30
D176645	500 L	15	100	50	N	100 L	15	20	N	30	30

Sample	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D176640	1000	300	100	7	150
D176641	1000	70	50	3	150
D176642	2000	150	30	3	150
D176643	2000	150	50	3	150
D176644	1500	300	70	5	150
D176645	300	300	70	7	150

Table 9c.--Major and minor oxide and trace element composition of the laboratory ash of 4 Anderson coal samples from USGS core hole RM-2, SW 1/4 NE 1/4 sec. 32, T. 56 N., R. 72 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Anderson coal bed 198.4 to 185.0 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D177704	198.4 - 199.1	17.6	58	8.9	8.9	2.77	1.03	1.0	3.0	0.050L	0.57
D177705	199.1 - 208.1	8.7	31	9.9	19	5.33	2.12	.42	3.1	.050L	1.2
D177706	211.0 - 219.0	6.8	22	9.4	23	6.76	2.74	.16	3.2	.050L	1.0
D177707	224.9 - 232.6	15.6	42	22	8.9	3.15	1.16	.83	2.4	.050L	.92

Sample	P_2O_5 %	SO_3 %	Cl %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S
D177704	1.0 L	8.4	0.20 L	1.0L	60	15	25 L	114	300	3000
D177705	1.0 L	11	.20 L	1.0L	189	17	30	52	700	7000
D177706	1.0 L	11	.20 L	1.0L	144	14	35	47	700	7000
D177707	1.0 L	6.0	.20 L	1.0L	124	49	35	133	300	3000

Sample	Be ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S
D177704	15	15	100	50	20 L	10	50	N	30	30
D177705	N	15	50	30	N	7	20	N	15	20
D177706	N	15	50	30	N	7	N	N	20	20
D177707	5	15	150	70	N	10	N	N	30	30

Sample	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177704	700	300	70	15	150
D177705	1500	200	50	7	150
D177706	1500	200	30	5	150
D177707	700	300	50	7	150

Table 9d.--Major and minor oxide and trace element composition of the laboratory ash of 4 Canyon A coal samples from USGS core hole RM-2, SW 1/4 NE 1/4 sec. 32, T. 56 N., R. 72 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Canyon A coal bed 236.5 to 265.2 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D177708	236.5 - 243.0	26.9	51	20	4.8	2.03	0.63	0.98	2.7	0.050L	0.96
D177709	243.0 - 246.4	21.6	42	21	5.5	2.26	.76	.39	2.2	.050L	1.1
D177710	249.8 - 256.2	5.7	11	8.3	24	7.75	2.98	.18	6.9	.070	.62
D177711	258.2 - 265.2	6.2	21	12	19	6.87	2.50	.25	3.2	.050L	.67

Sample	P_2O_5 %	SO_3 %	Cl %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D177708	1.0 L	5.7	0.20 L	1.0L	121	60	40	144	200	3000	7
D177709	1.0 L	6.4	.20 L	1.0	246	127	55	393	200	3000	7
D177710	1.0 L	18	.20 L	1.0L	100	10 L	25 L	50	1000	7000	N
D177711	1.0 L	17	.20 L	1.0L	165	16	50	29	1000	5000	15

Sample	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S
D177708	15	150	50	N	100 L	20	20	N	50	20
D177709	15	70	50	N	100 L	30	20	150	70	20
D177710	10	50	20	N	N	7	N	B	30	15
D177711	15	70	30	N	N	10	20	B	50	30

Sample	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177708	2000	300	70	7	150
D177709	2000	300	70	10	150
D177710	2000	150	30	3	100
D177711	1500	300	70	7	150

Table 9e.--Major and minor oxide and trace element composition of the laboratory ash of 3 Canyon B coal samples from USGS core hole RM-2, SW ¼ NE ¼ sec. 32, T. 56 N., R. 72 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Canyon B coal bed 311.2 to 330.6 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D177712	311.2 - 313.0	7.3	13	8.2	17	7.70	1.81	0.17	6.8	0.050L	0.29
D177713	313.0 - 323.0	7.1	11	5.4	19	7.15	2.05	.12	13	.11	.35
D177714	324.0 - 330.6	7.5	21	12	16	5.51	2.19	.33	5.4	.056	.48

Sample	P_2O_5 %	SO_3 %	Cl %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D177712	1.0 L	25	0.20 L	1.0L	57	10 L	25	20	1000	5000	50
D177713	1.7	11	.20 L	1.0L	37	10 L	25 L	31	1000	10000	N
D177714	2.4	13	.20 L	1.0L	76	19	50	34	1000	10000	3

Sample	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S
D177712	70	70	50	100	N	7	20	N	100	20
D177713	10 L	20	15	N	N	7	N	N	20	N
D177714	15	10	30	N	100 L	10	20	N	50	15

Sample	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177712	1000	100	100	10	100
D177713	2000	70	20	B	100
D177714	2000	150	70	5	100

Table 9f.—Major and minor oxide and trace element composition of the laboratory ash of 15 Anderson coal samples from USGS core hole RM-3, NW 1/4 NW 1/4 sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Anderson coal bed 92.5 to 124.5 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D176502	92.5 - 95.3	16.0	50	11	15	3.83	0.65	1.1	4.0	0.045	0.83
D176503	95.3 - 97.3	7.9	21	13	31	6.66	1.31	.71	5.6	.084	.58
D176504	97.3 - 99.5	8.6	23	14	30	6.44	1.40	.31	4.8	.095	.74
D176505	99.5 - 102.5	15.0	35	21	19	4.03	.92	.29	3.2	.063	1.6
D176506	102.5 - 105.3	6.6	12	12	35	7.24	2.31	.22	5.6	.11	.69
D176507	105.3 - 107.1	7.7	14	13	34	6.91	2.13	.16	4.9	.11	.83
D176508	107.1 - 110.5	7.5	17	11	34	6.99	2.20	.16	5.0	.12	1.0
D176509	110.5 - 112.0	5.8	7.5	10	37	7.60	3.10	.19	6.3	.11	.70
D176510	112.0 - 114.5	6.7	16	11	35	7.39	2.63	.18	4.3	.12	.53
D176511	114.5 - 116.5	7.4	18	9.6	34	7.19	2.54	.16	5.0	.12	.59
D176512	116.5 - 118.5	7.0	15	10	34	7.25	2.83	.20	5.2	.11	.91
D176513	118.8 - 120.5	7.0	15	10	35	7.20	2.93	.17	5.0	.11	.64
D176514	120.5 - 122.5	6.5	5.8	11	35	7.70	3.01	.17	5.4	.11	.50
D176515	122.5 - 123.9	26.0	45	26	8.5	2.84	.84	1.3	3.2	.027	.93
D176516	123.9 - 124.5	36.6	51	28	3.9	1.88	.55	1.4	3.2	.012	.87

Sample	P_2O_5 %	SO_3 %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D176502	1.0	11	1.0L	121	20 L	25 L	77	300	2000	N
D176503	2.2	16	1.0L	123	20 L	25 L	33	700	5000	N
D176504	2.1	14	1.0L	128	48	25	36	700	5000	N
D176505	3.4	9.7	1.0L	242	115	30	28	300	7000	N
D176506	2.5	18	1.0L	146	33	25 L	65	1000	7000	N
D176507	4.6	7.6	1.0L	158	32	25 L	30	700	10000	N
D176508	2.6	11	1.0L	214	38	25 L	41	700	7000	N
D176509	3.3	18	1.0L	126	20 L	25 L	30	1000	7000	N
D176510	3.0	12	1.0L	92	20	25 L	67	700	10000	N
D176511	2.7	11	1.0L	94	20	25 L	28	700	7000	N
D176512	2.7	12	1.0L	151	20 L	40	26	700	7000	N
D176513	3.6	12	1.0L	126	20 L	25	53	700	10000	N
D176514	2.6	25	1.0L	94	20 L	35	152	700	7000	N
D176515	1.2	4.5	1.0L	186	47	30	55	200	3000	3
D176516	.24	2.5	1.0	142	64	55	244	150	1000	7

Table 9f.--Major and minor oxide and trace element composition of the laboratory ash of 15 Anderson coal samples from USGS core hole RM-3, NW 1/4 NW 1/4 sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming--Continued

Sample	Ce ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S
D176502	N	15	70	30	100 L	7	30		N	2020
D176503	N	15	70	30	100 L	10	20 L		N	30 15
D176504	N	15	70	30	N	7	20 L		B	3020
D176505	500 L	15	70	50	100	7	30	150 L	20	30
D176506	N	20	50	30	N	30	20 L		B	5030
D176507	N	15	30	30	100 L	N	20 L		N	3030
D176508	N	15	30	15	N	30	20		B	3020
D176509	N	15	30	30	N	15	20 L		B	3020
D176510	N	15	50	15	N	15	20 L		B	3030
D176511	N	15	30	15	N	7	20 L		B	3020
D176512	N	15	50	15	N	15	20 L		B	3015
D176513	N	15	50	20	100 L	20	20 L		N	5015
D176514	N	30	70	30	N	50	20 L		B	7015
D176515	N	15	150	50	100	15	30	150 L	30	30
D176516	N	15	150	50	100 L	15	30	150 L	30	30

Sample	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D176502	700	150	70	7	300
D176503	1000	150	30	5	150
D176504	1000	200	30	7	150
D176505	1000	300	30	5	200
D176506	1500	300	30	5	150
D176507	3000	200	30	5	150
D176508	1500	200	30	3	200
D176509	2000	200	30	3	150
D176510	2000	150	30	3	150
D176511	1500	150	30	3	150
D176512	1500	150	30	3	150
D176513	2000	150	30	3	150
D176514	1500	150	50	3	150
D176515	1500	500	50	5	200
D176516	300	300	50	5	200

Table 9g.--Major and minor oxide and trace element composition of the laboratory ash of 7 Anderson coal samples from USGS core hole RM-4, SW 1/4 SW 1/4 sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Anderson coal bed 129.4 to 167.0 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D176799	129.4 - 130.0	8.0	25	8.8	19	6.76	2.70	0.41	4.3	0.050L	0.96
D176800	130.0 - 136.4	7.4	19	12	21	7.79	2.98	.46	4.8	.050L	.87
D176801	136.4 - 143.0	7.9	19	14	19	7.89	2.83	.16	4.1	.050L	1.6
D176802	143.0 - 148.9	6.9	19	13	21	7.84	3.08	.16	4.6	.050L	1.3
D176803	148.9 - 156.7	6.9	20	12	22	7.90	3.20	.16	4.1	.050L	1.7
D176804	156.7 - 163.0	6.5	1.7	11	22	7.93	3.43	.14	4.0	.050L	.85
D176805	163.0 - 167.0	20.4	42	24	5.7	3.09	.93	.98	3.4	.050L	1.0

Sample	P_2O_5 %	SO_3 %	Cl %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D176799	1.0 L	21	0.20 L	1.0L	55	10 L	25	97	700	3000	20
D176800	1.0 L	18	.20 L	1.0	111	12	35	116	700	5000	N
D176801	1.0 L	14	.20 L	1.0L	215	40	45	128	500	5000	N
D176902	1.0 L	13	.20 L	1.0	157	34	35	58	700	5000	N
D176903	1.0 L	13	.20 L	1.0	212	20	35	153	500	5000	N
D176904	20	7.9	.20 L	1.0L	101	10 L	25	138	700	7000	N
D176905	1.0 L	9.9	.20 L	1.0L	117	49	30	271	200	1500	7

Sample	Ce ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S
D176799	N	15	100	B	30	N	15	50	B	30
D176800	N	15	70	20	N	N	15	20 L	B	30
D176801	N	15	70	30	N	100 L	15	30	N	30
D176802	N	15	30	15	N	N	N	20	B	20
D176803	N	15	30	15	N	N	N	30	B	20
D176804	N	15	30	15	N	100 L	15	20	N	30
D176805	500 L	15	100	30	N	100 L	15	30	N	30

Sample	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D176799	70	700	500	150	150	300
D176800	15	700	150	30	3	150
D176801	20	700	300	30	3	200
D176802	20	700	150	30	3	150
D176803	15	700	200	30	3	200
D176804	15	700	100	30	3	150
D176805	20	500	300	70	5	150

Table 9h.--Major and minor oxide and trace element composition of the laboratory ash of 6 Canyon A coal samples from USGS core hole RM-4, SW¼ SW¼ sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Canyon A coal bed 298.0 to 320.5 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D176806	298.0 - 299.0	10.9	7.7	8.3	11	4.43	1.73	0.20	29	0.050L	0.43
D176807	299.0 - 303.0	10.8	35	9.1	13	4.63	1.85	.27	2.9	.050L	2.0
D176808	305.0 - 306.0	10.4	38	11	11	4.20	1.96	.76	6.4	.050L	.92
D176809	306.0 - 308.4	5.9	6.6	12	23	8.27	3.90	.20	4.6	.050L	.79
D176810	308.4 - 312.0	6.2	11	9.5	21	7.75	3.66	.17	10	.089	.89
D176811	312.0 - 316.0	5.9	21	12	21	7.79	3.59	.23	4.7	.050L	1.0
D176812	316.0 - 320.5	5.7	17	13	21	7.95	3.81	.32	4.9	.050L	1.0

Sample	P_2O_5 %	SO_3 %	Cl %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D176806	1.3	27	0.20 L	1.5	61	10 L	25 L	374	300	3000	30
D176807	1.0 L	25	.20 L	1.0L	121	11	30	115	300	3000	15
D176808	1.0 L	17	.20 L	1.0L	68	10	25 L	398	300	3000	10
D176809	1.2	24	.20 L	1.0L	60	10 L	25	85	700	7000	7
D176810	1.0 L	16	.20 L	1.0L	107	10 L	25 L	145	700	5000	N
D176811	1.0 L	12	.20 L	1.0L	126	10 L	35	147	700	7000	7
D176812	1.0 L	14	.20 L	1.0L	160	10	55	157	700	7000	10

Sample	Ce ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S
D176806	500 L	70	50	B	70	100 L	70	30	N	
D176807	500 L	10	50	20	N	100 L	15	30	N	30
D176808	500 L	20	70	70	N	100 L	7	50	N	50
D176809	N	30	30	15	N	100 L	7	20 L	N	70
D176810	N	15	30	15	N	N	7	20	B	50
D176811	N	15	30	15	N	100 L	7	30	N	30
D176812	500 L	20	200	30	N	150	15	30	150	30

Sample	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D176807	15	700	150	70	7	200
D176808	30	700	150	70	7	300
D176809	15	1500	100	70	7	100
D176810	15	700	100	30	5	150
D176811	20	1000	150	70	7	200
D176812	30	1000	300	100	7	200

Table 9i.--Major and minor oxide and trace element composition of the laboratory ash of 7 Canyon B coal samples from USGS core hole RM-4, SW 1/4 SW 1/4 sec. 25, T. 56 N., R. 73 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Canyon B coal bed 323.0 to 349.0 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D176813	323.0 - 327.0	8.8	36	16	14	5.59	2.15	0.50	4.1	0.050L	0.82
D176814	327.0 - 332.3	5.3	9.0	11	24	8.62	3.94	.19	11	.20	.57
D176815	332.3 - 335.3	6.4	12	7.3	19	7.84	2.98	.19	22	.37	.40
D176816	335.3 - 338.4	5.8	14	5.3	19	8.12	3.46	.18	18	.31	.45
D176817	338.4 - 342.0	4.4	6.9	11	27	9.50	4.66	.22	4.9	.050L	.50
D176818	342.0 - 346.0	7.8	22	18	14	5.31	2.46	.39	5.0	.050L	.99
D176819	346.0 - 349.0	11.7	38	18	10	3.75	1.55	.55	2.9	.050L	1.1

Sample	P_2O_5 %	SO_3 %	Cl %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D176813	1.0 L	11	0.20 L	1.0L	85	26	45	339	500	3000	15
D176814	1.0 L	7.5	.20 L	1.0L	28	10 L	30	142	700	7000	N
D176815	1.0 L	7.9	.20 L	1.0L	45	10 L	25 L	217	700	3000	3
D176816	1.0 L	7.5	.20 L	1.0L	32	10 L	25 L	66	500	5000	N
D176817	1.0 L	13	.20 L	1.0L	52	10 L	30	73	700	7000	N
D176818	1.0 L	17	.20 L	1.0L	121	37	25 L	74	500	3000	3
D176819	1.0 L	14	.20 L	1.0L	144	39	25	288	300	3000	7

Sample	Ce ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S
D176813	500 L	30	50	15	N	100 L	10	20	N	30
D176814	N	10	15	15	N	N	7	30	N	20
D176815	B	15	15	15	N	N	7	20 L	B	30
D176816	N	10 L	15	10	N	N	7	20 L	B	30
D176817	N	15	15	10	N	N	7	20 L	B	50
D176818	500	20	50	30	N	150	10	30	200	70
D176819	500 L	15	70	20	N	100 L	7	20	N	50

Sample	Sc ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D176813	20	500	150	100	7	150
D176814	10 L	1000	70	20	3	150
D176815	10	700	50	30	7	70
D176816	10 L	700	30	20 L	2 L	70
D176817	10	700	70	30	3	70
D176818	15	700	200	70	7	150
D176819	20	500	200	70	7	150

Table 9j.--Major and minor oxide and trace element composition of the laboratory ash of 6 Anderson coal samples from USGS core hole RM-5, SE 1/4 SE 1/4 sec. 27, T. 56 N., R. 73 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Anderson coal bed coal bed 135.2 to 168.6 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D177715	135.2 - 136.2	17.2	50	8.2	8.4	2.71	1.13	1.0	4.2	0.050L	0.49
D177716	136.2 - 140.0	9.1	34	11	16	4.68	2.36	.73	2.9	.057	.67
D177717	140.0 - 149.0	1.8	31	16	14	3.97	1.74	.33	3.2	.050L	1.3
D177718	149.0 - 157.2	7.8	24	11	21	6.04	2.73	.14	3.1	.063	1.2
D177719	157.2 - 165.6	7.2	16	9.6	22	6.54	3.16	.14	4.7	.069	.80
D177720	165.6 - 168.6	21.6	43	21	6.5	2.51	1.05	.90	2.6	.050L	.89

Sample	P_2O_5 %	SO_3 %	Cl %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D177715	1.0 L	11	0.20 L	1.0L	52	18	25	115	700	2000	15
D177716	1.0 L	12	.20 L	1.0L	85	15	25 L	57	1000	3000	N
D177717	1.0 L	11	.20 L	1.0L	186	97	40	63	700	5000	N
D177718	1.0 L	11	.20 L	1.0L	140	43	25	36	1000	7000	N
D177719	1.0 L	17	.20 L	1.0L	94	16	25	38	1000	7000	N
D177720	1.0 L	8.8	.20 L	1.0	147	72	45	169	300	3000	10

Sample	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S
D177715	15	70	50	N	N	15	30	B	30	20
D177716	15	70	30	N	N	10	N	B	20	15
D177717	15	70	30	N	100 L	10	20	N	50	20
D177718	10	50	30	N	N	7	20	B	15	20
D177719	10	50	30	N	N	15	N	B	20	15
D177720	10	200	70	20	150	50	30	150	30	30

Sample	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177715	500	300	70	7	200
D177716	1000	200	50	5	150
D177717	1000	300	50	5	150
D177718	2000	200	50	5	150
D177719	2000	150	30	3	100
D177720	500	500	150	15	150

Table 9k.--Major and minor oxide and trace element composition of the laboratory ash of 9 Canyon coal samples from USGS core hole RM-5, SE 1/4 SE 1/4 sec. 27, T. 56 N., R. 73 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Canyon coal bed 354.9 to 395.5 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D177721	354.9 - 356.4	9.3	7.6	6.2	15	4.86	2.20	0.092	13	0.086	0.38
D177722	356.5 - 360.2	8.9	27	9.1	18	5.68	2.35	.14	2.6	.090	1.4
D177723	360.2 - 361.8	70.7	83	9.5	.82	.65	.20	1.5	.71	.050L	.68
D177724	361.8 - 370.7	6.1	13	10	22	7.45	3.35	.13	4.5	.082	.64
D177725	371.1 - 374.8	10.4	39	14	14	4.68	1.92	.78	2.3	.067	1.0
D177726	374.8 - 375.9	13.1	61	21	.78	1.08	.26	1.6	1.9	.050L	.70
D177727	375.9 - 384.3	5.9	12	9.4	26	8.57	3.17	.17	4.3	.14	.47
D177728	384.3 - 392.2	6.0	8.7	9.4	24	7.70	3.27	.13	8.4	.17	.48
D177729	392.2 - 395.5	20.2	40	22	6.2	2.61	.92	.74	4.3	.066	.86

Sample	P_2O_5 %	SO_3 %	Cl %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D177721	1.0 L	34	0.20 L	1.0L	64	10	25 L	64	700	5000	20
D177722	1.0	17	.20 L	1.0L	146	25	35	44	700	7000	N
D177723	1.0 L	.70	.20	1.0L	31	31	25 L	29	100	700	N
D177724	1.5	14	.20 L	1.0L	127	13	30	39	1000	10000	3
D177725	1.0 L	5.9	.20 L	1.0L	144	34	30	44	700	7000	5
D177726	1.0 L	.21	.20 L	1.0L	46	65	30	189	100	700	N
D177727	1.1	10	.20 L	1.0L	52	14	25	75	1000	10000	3
D177728	1.7	16	.20 L	1.0L	46	10 L	25 L	62	1000	15000	N
D177729	1.0 L	9.0	.20 L	1.0L	121	75	45	128	300	2000	3

Table 9k.--Major and minor oxide and trace element composition of the laboratory ash of 9 Canyon coal samples from USGS core hole RM-5, SE 1/4 SE 1/4, sec. 27, T. 56 N., R. 73 W., Campbell County, Wyoming.--Continued

Sample	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S
D177721	N	15	30	N	100 L	30	N	N	50	15	700
D177722	10	70	30	N	100 L	7	30	N	30	15	1500
D177723	10 L	70	20	N	N	N	30	N	10 L	10	200
D177724	20	50	20	N	N	10	N	N	30	15	3000
D177725	15	100	50	N	100 L	7	30	N	20	30	1000
D177726	20	100	50	N	N	N	30	N	50	15	300
D177727	15	30	30	N	100 L	7	20	N	30	10	2000
D177728	10	30	20	N	100	10	N	N	30	10	3000
D177729	30	100	70	N	100 L	15	30	N	100	15	500

Sample	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177721	70	100	10	70
D177722	200	70	7	150
D177723	100	30	5	300
D177724	150	50	5	150
D177725	300	70	7	150
D177726	300	30	3	150
D177727	70	50	5	70
D177728	100	50	5	70
D177729	300	70	7	150

Table 91.--Major and minor oxide and trace element composition of the laboratory ash of 5 Anderson coal samples from USGS core hole RM-6, NW 1/4 NE 1/4 sec. 21, T. 56 N., R. 73 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Anderson coal bed 88.9 to 120.0 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D177730	88.9 - 90.4	9.6	33	14	15	4.12	2.15	0.89	2.7	0.064	0.72
D177731	90.4 - 97.7	11.6	29	17	14	4.00	1.96	.54	3.4	.062	.90
D177732	97.7 - 107.4	13.5	32	18	13	3.59	1.65	.38	4.3	.065	1.3
D177733	107.4 - 116.9	15.4	16	11	23	6.34	3.31	.10	3.9	.080	.74
D177734	116.9 - 120.0	11.9	30	18	13	4.17	2.05	.65	2.6	.061	1.1

Sample	P_2O_5 %	SO_3 %	Cl %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D177730	1.0 L	14	0.20 L	1.0L	70	23	25	90	1000	5000	15
D177731	1.0 L	13	.20 L	1.0L	135	47	40	42	500	5000	N
D177732	1.0 L	11	.20 L	1.0L	260	95	35	207	500	5000	N
D177733	1.0 L	14	.20 L	1.0L	118	28	25	32	1000	7000	N
D177734	1.0 L	14	.20 L	1.0L	161	36	40	36	500	5000	3

Sample	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S
D177730	15	100	70	N	N	50	20	N	30	30
D177731	15	150	70	N	100 L	15	20	N	30	30
D177732	15	100	50	N	100 L	15	30	N	50	30
D177733	10	50	30	N	N	7	20	N	15	20
D177734	10	150	70	N	100 L	20	30	N	20	20

Sample	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177730	1000	300	100	10	150
D177731	1000	300	70	7	150
D177732	1000	300	70	7	150
D177733	1500	150	30	3	100
D177734	1000	500	70	7	150

Table 9m.--Major and minor oxide and trace element composition of the laboratory ash of 6 Canyon coal samples from USGS core hole RM-6, NW 1/4 SE 1/4 sec. 21, T. 56 N., R. 73 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Canyon coal bed 256.5 to 302.7 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D177735	265.5 - 257.2	23.7	50	17	6.0	3.34	0.86	2.8	3.7	0.072	0.72
D177736	257.2 - 261.2	10.8	29	22	13	4.05	1.96	.79	3.0	.075	.82
D177737	272.1 - 272.7	44.3	49	22	2.6	1.93	.50	1.5	5.6	.070	.67
D177738	272.7 - 285.2	15.6	42	22	9.1	3.30	1.34	1.0	4.0	.073	.93
D177739	285.2 - 297.9	6.8	18	7.5	24	6.91	2.94	.18	7.7	.20	.57
D177740	297.9 - 302.7	5.9	14	7.8	27	7.37	3.44	.21	4.3	.13	.57

Sample	P_2O_5 %	SO_3 %	Cl %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D177735	1.0 L	6.3	0.20 L	1.0L	115	47	50	207	300	3000	20
D177736	1.0 L	12	.20 L	1.0L	110	53	40	38	700	5000	15
D177737	1.0 L	4.8	.20 L	1.0L	85	66	35	237	150	1000	15
D177738	1.0 L	7.2	.20 L	1.0L	122	65	40	167	500	3000	3
D177739	1.0 L	5.5	.20 L	1.0L	46	11	25 L	38	1000	7000	N
D177740	1.1	10	.20 L	1.0L	61	10 L	25	43	1000	10000	5

Sample	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Sc ppm-S
D177735	50	150	70	100	100 L	15	30	150	100	30
D177736	20	150	50	N	100 L	10	20	N	50	20
D177737	30	150	50	N	N	15	20	N	70	20
D177738	15	100	30	N	100 L	7	20	N	50	20
D177739	N	30	15	N	N	7	N	N	15	10 L
D177740	10	70	20	N	100	100	20	N	50	20

Sample	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177735	2000	300	150	15	150
D177736	1000	300	70	7	150
D177737	500	300	70	7	150
D177738	1500	300	50	7	150
D177739	2000	70	30	3	150
D177740	2000	150	70	7	100

Table 9n.--Major and minor oxide and trace element composition of the laboratory ash of 5 Anderson coal samples from USGS core hole RM-7, NE ¼ NW ¼ sec. 26, T. 56 N., R. 73 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Anderson coal bed 133.2 to 170.3 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D177741	133.2 - 134.0	7.3	27	12	20	6.47	2.86	0.52	3.4	0.055	0.64
D177742	134.0 - 141.0	6.8	23	10	22	7.07	2.77	.26	4.2	.050L	.70
D177743	141.0 - 154.0	7.6	25	12	21	6.66	2.50	.17	3.3	.050L	1.5
D177744	154.0 - 161.9	6.6	18	12	23	7.85	3.27	.16	3.7	.050L	.72
D177745	161.9 - 170.3	7.5	22	16	18	6.41	2.81	.42	4.4	.050L	.63

Sample	P_2O_5 %	SO_3 %	Cl %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D177741	1.0 L	13	0.20 L	1.0L	153	15	30	77	1000	5000	50
D177742	1.0 L	10	.20 L	1.0L	92	12	25	30	1000	7000	7
D177743	1.0 L	9.4	.20 L	1.0L	221	31	30	49	700	7000	N
D177744	1.0 L	9.8	.20 L	1.0L	100	31	25	57	700	7000	N
D177745	1.0 L	14	.20 L	1.0	141	47	50	101	1000	5000	15

Sample	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S
D177741	15	150	150	50	N	15	70	20	100	1000
D177742	10	50	20	N	N	N	N	15	25	2500
D177743	10	70	30	N	N	N	N	15	20	1000
D177744	15	50	30	N	100 L	N	N	20	30	2000
D177745	15	100	50	N	150	50	20	30	50	2000

Sample	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177741	700	150	20	300
D177742	150	70	5	100
D177743	300	50	5	150
D177744	200	30	3	150
D177745	500	150	15	150

Table 9o.--Major and minor oxide and trace element composition of the laboratory ash of 6 Canyon A coal samples from USGS core hole RM-7, NE 1/4 NW 1/4 sec. 26, T. 56 N., R. 73 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, . etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Canyon coal bed 286.2 to 329.6 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D177746	286.2 - 287.3	18.2	28	10	5.9	2.77	0.85	1.3	19	0.050L	0.46
D177747	287.3 - 297.3	7.6	21	9.4	19	6.76	2.23	.18	6.3	.050L	1.0
D177748	299.2 - 306.3	13.1	23	8.8	23	7.87	2.73	.18	3.7	.050L	.79
D177749	306.3 - 317.7	5.3	12	9.1	26	8.96	3.02	.17	4.1	.050L	.52
D177750	317.7 - 326.0	6.2	9.3	9.0	20	6.99	2.55	.15	14	.089	.48
D177751	326.0 - 329.6	17.4	44	22	6.7	2.84	.92	.85	3.3	.050L	1.0

Sample	P_2O_5 %	SO_3 %	Cl %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D177746	1.0 L	14	0.20 L	1.0L	80	23	25 L	75	300	2000	30
D177747	1.1	18	.20 L	1.0L	115	17	25	26	700	7000	3
D177748	1.0 L	6.8	.20 L	1.0L	109	16	30	27	1000	7000	N
D177749	1.6	4.7	.20 L	1.0L	37	10 L	25 L	28	1000	10000	N
D177750	1.9	17	.20 L	1.0L	61	10 L	25 L	59	1000	10000	N
D177751	1.0 L	7.5	.20 L	1.0L	138	62	45	85	300	3000	7

Sample	Ce ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Ge ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Ni ppm-S	Sc ppm-S
D177746	N	15	70	70	100	N	30	20	50	30
D177747	N	10	70	30	N	N	N	N	20	15
D177748	N	10	50	30	N	N	N	20	15	15
D177749	N	10 L	30	30	N	N	N	20	10	10
D177750	N	15	50	30	N	150	15	N	50	15
D177751	500 L	30	200	100	N	100	15	50	50	30

Sample	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177746	300	300	70	7	200
D177747	1500	200	30	3	150
D177748	1500	150	30	3	150
D177749	3000	70	30	3	150
D177750	3000	100	50	5	100
D177751	700	700	70	7	300

Table 9p.--Major and minor oxide and trace element composition of the laboratory ash of 2 Cook coal samples from USGS core hole RM-7, NE 1/4 NW 1/4 sec. 26, T. 56 N., R. 73 W., Campbell County, Wyoming

[Values are in either percent or parts per million. The coals were ashed at 525°C. L after a value means less than the value shown, N means not detected, and B means not determined. S after the element title means that the values listed were determined by semiquantitative spectrographic analysis. The spectrographic results are to be identified with geometric brackets whose boundaries are 1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, etc., but are reported arbitrarily as mid-points of those brackets, 1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc. The precision of the spectrographic data is approximately one bracket at 68 percent, or two brackets at 95 percent confidence.]

Cook coal bed 369.6 to 382.0 feet

Sample	Depth (feet)	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
D177752	369.6 - 370.8	52.8	62	20	2.1	1.71	0.32	1.5	2.5	0.050L	0.86
D177753	370.8 - 382.0	8.3	33	12	17	5.38	1.84	.40	3.6	.050L	.86

Sample	P_2O_5 %	SO_3 %	Cl %	Cd ppm	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S
D177752	1.0 L	1.6	0.20 L	1.0L	48	40	25	114	150	1000	10
D177753	1.5	11	.20 L	1.0L	100	24	25 L	46	1000	7000	7

Sample	Co ppm-S	Cr ppm-S	Ga ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S
D177752	10	150	50	100 L	N	30	20	30	500
D177753	15	100	100	100	15	15	30	30	2000

Sample	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
D177752	300	50	5	200
D177753	200	100	7	200

Table 10a. Proximate, ultimate, Btu, forms-of-sulfur and fusibility of ash analyses of 9 samples from Anderson coal bed USGS core hole RM-1 SW 1/4 NW 1/4 sec. 33, T. 56 N., R. 72 W., Campbell County, Wyo.

[All analyses except Btu and fusibility of ash in percent. Original moisture content may be slightly more than shown because samples were collected and transported in plastic bags to avoid metal contamination and water was added where necessary to maintain 100 percent humidity within the bag. Form of analyses: 1, as received; 2, moisture free; 3, moisture and ash free; 4, air dried 30-35°C until constant weight achieved. All analyses by U.S. Bureau of Mines, Coal Analysis Section, Pittsburgh, Pa. (---) indicate no data; 1 ft = .305 meters; to convert from degrees Fahrenheit to degrees Centigrade subtract 32° and multiply by 5/9. To convert Btu/lb to Kcal/kg, multiply by 0.5556.]

			Proximate analysis				Ultimate Analysis						Forms of sulfur			Fusibility of Ash (°F)		
Sample	Depth (ft)	Forms of analysis	Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Sulfur	Btu/lb	Sulfate	Pyritic	Organic	Initial deformation	Softening	Fluid
D176630	148.2 - 149.0	1	31.5	29.6	31.4	7.5	6.4	43.5	0.7	41.4	0.5	7360	0.01	0.01	0.45	2050	2090	2130
		2	---	43.2	45.8	10.9	4.2	63.5	1.0	19.6	.7	10740	.01	.01	.45			
		3	---	48.5	51.5	---	4.8	71.3	1.1	22.0	.8	12070	.02	.02	.74			
		4	10.8	38.5	40.9	9.8	5.0	56.8	1.0	26.8	.6	9590	---	---	---			
D176631	149.0 - 157.0	1	33.3	29.6	33.1	4.0	6.9	44.8	.4	43.5	.4	7540	.01	.01	.35	2300	2340	2380
		2	---	44.4	49.6	6.0	4.8	67.2	.6	20.8	.6	11300	.01	.01	.52			
		3	---	47.2	52.8	---	5.1	71.5	.6	22.2	.6	12030	.02	.02	.56			
		4	14.0	38.2	42.9	5.2	5.7	57.8	.6	30.2	.5	9730	---	---	---			
D176632	157.0 - 162.0	1	31.4	32.4	32.5	3.7	7.1	46.1	.6	42.2	.3	7860	.01	.01	.26	2310	2350	2390
		2	---	47.2	47.4	5.4	5.3	67.2	.9	20.8	.4	11460	.01	.01	.38			
		3	---	49.9	50.1	---	5.6	71.0	.9	22.0	.5	12110	.02	.02	.40			
		4	11.8	41.7	41.7	4.8	5.9	59.3	.8	28.8	.4	10110	---	---	---			
D176633	162.0 - 166.1	1	32.3	29.7	32.7	5.4	6.6	44.6	.7	42.4	.3	7500	.01	.01	.25	2140	2170	2200
		2	---	43.9	48.3	8.0	4.4	65.9	1.0	20.2	.4	11080	.01	.01	.37			
		3	---	47.7	52.5	---	4.8	71.6	1.1	22.0	.5	12040	.02	.02	.40			
		4	11.6	38.7	42.7	7.0	5.3	58.2	.9	28.3	.3	9790	---	---	---			
D176635	167.0 - 172.5	1	31.3	31.3	33.0	4.4	6.8	46.9	.6	41.0	.3	7950	.01	.01	.24	2360	2390	2420
		2	---	45.6	48.0	6.4	4.8	68.3	.9	19.2	.4	11570	.01	.01	.35			
		3	---	48.7	51.3	---	5.2	72.9	.9	20.5	.5	12360	.02	.02	.37			
		4	12.9	39.7	41.8	5.6	5.6	59.4	.7	28.4	.3	10080	---	---	---			
D176636	172.5 - 175.0	1	32.5	30.4	33.3	3.8	6.7	46.2	.6	42.5	.2	7800	.01	.01	.23	2350	2380	2410
		2	---	45.0	49.3	5.6	4.6	68.4	.9	20.2	.3	11560	.01	.01	.34			
		3	---	47.7	52.3	---	4.8	72.5	.9	21.4	.3	12240	.02	.02	.36			
		4	12.3	39.5	43.2	5.0	5.5	59.9	.8	28.3	.3	10130	---	---	---			
D176637	175.0 - 177.4	1	35.0	29.0	30.5	5.5	6.9	42.9	.7	43.5	.5	7280	.02	.01	.53	2350	2380	2410
		2	---	44.6	46.9	8.5	4.6	66.0	1.1	19.1	.8	11200	.03	.02	.82			
		3	---	48.0	51.3	---	5.1	72.1	1.2	20.8	.8	11240	.03	.02	.89			
		4	13.5	38.0	40.5	7.4	5.5	57.1	.9	28.4	.7	9690	---	---	---			
D176638	177.4 - 181.0	1	31.0	28.1	30.6	10.3	6.3	41.8	.7	40.3	.6	7030	.01	.01	.59	2350	2380	2410
		2	---	40.7	44.3	14.9	4.1	60.6	1.0	18.5	.9	10180	.01	.01	.86			
		3	---	47.9	52.1	---	4.9	71.2	1.2	21.7	1.0	11980	.02	.02	1.01			
		4	11.8	35.9	39.1	13.2	5.0	53.5	.8	26.7	.8	9000	---	---	---			
D176639	181.0 - 185.0	1	29.6	27.6	32.3	10.5	6.1	44.0	.7	37.7	1.0	7320	.04	.13	.78	2120	2150	2180
		2	---	39.2	45.9	14.9	4.0	62.5	1.0	16.2	1.4	10400	.06	.18	1.11			
		3	---	46.1	53.9	---	4.7	73.5	1.2	19.0	1.7	12220	.07	.22	1.30			
		4	11.9	34.6	40.4	13.1	4.8	55.1	.9	29.9	1.2	9160	---	---	---			

Table 10b.--Proximate, ultimate, Btu, forms-of-sulfur and fusibility of ash analyses of 5 samples from Canyon A coal bed USGS core hole RM-1 SW¼ NW¼ sec. 33, T. 56 N., R. 72 W., Campbell County, Wyo.

[All analyses except Btu and fusibility of ash in percent. Original moisture content may be slightly more than shown because samples were collected and transported in plastic bags to avoid metal contamination and water was added where necessary to maintain 100 percent humidity within the bag. Form of analyses: 1, as received; 2, moisture free; 3, moisture and ash free; 4, air dried 30-35°C until constant weight achieved. All analyses by U.S. Bureau of Mines, Coal Analysis Section, Pittsburgh, Pa. (---) indicate no data; 1 ft = .305 meters; to convert from degrees Fahrenheit to degrees Centigrade subtract 32° and multiply by 5/9. To convert Btu/lb to Kcal/kg, multiply by 0.5556.]

			Proximate analysis				Ultimate Analysis						Forms of sulfur			Fusibility of Ash (°F)		
Sample	Depth (ft)	Forms of analysis	Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Sulfur	Btu/lb	Sulfate	Pyritic	Organic	Initial deformation	Softening	Fluid
D176640	187.8 - 196.0	1	34.0	28.1	30.6	7.3	6.7	42.9	0.6	41.8	0.7	7170	0.01	0.03	0.62	2120	2150	2180
		2	---	42.6	46.4	11.1	4.4	65.0	.9	17.5	1.1	10860	.02	.05	.94			
		3	---	47.9	52.1	---	5.0	73.1	1.0	19.7	1.2	12210	.02	.05	1.06			
		4	12.4	37.3	40.6	9.7	5.2	56.9	.9	26.4	.9	9520	---	---	---			
D176641	195.0 - 198.0	1	31.8	29.2	35.3	3.7	6.7	47.3	.7	41.2	.4	7890	.01	.02	.39	2400	2430	2460
		2	---	42.8	51.8	5.4	4.6	69.4	1.0	19.0	.6	11570	.01	.03	.57			
		3	---	45.3	54.7	---	4.9	73.3	1.1	20.1	.6	12230	.02	.03	.60			
		4	13.5	37.0	44.8	4.7	5.6	60.0	.9	28.3	.5	10000	---	---	---			
D176642	198.0 - 202.0	1	33.4	29.1	34.1	3.4	6.7	46.0	.5	43.1	.3	7700	.01	.01	.25	2410	2440	2470
		2	---	43.7	51.2	5.1	4.5	69.1	.8	20.1	.5	11560	.02	.02	.38			
		3	---	46.0	54.0	---	4.7	72.8	.8	21.2	.5	12180	.02	.02	.40			
		4	13.7	37.7	44.1	4.5	5.5	59.6	.7	29.7	.3	9980	---	---	---			
D176644	204.9 - 207.9	1	30.1	31.4	33.2	5.3	6.6	46.8	.6	40.3	.4	7900	.01	.01	.42	2310	2340	2370
		2	---	44.9	47.5	7.6	4.7	67.0	.9	19.4	.6	11300	.01	.01	.60			
		3	---	48.6	51.4	---	5.0	72.4	.9	21.0	.6	12200	.02	.02	.65			
		4	14.6	38.4	40.5	6.4	5.6	57.2	.8	29.5	.5	9650	---	---	---			
D176645	207.9 - 210.3	1	32.5	29.5	28.3	9.7	6.5	41.0	.5	41.7	.6	6900	.01	.01	.60	2280	2320	2360
		2	---	43.7	41.9	14.4	4.3	60.7	.7	19.0	.9	10220	.01	.01	.89			
		3	---	53.0	49.0	---	5.0	70.9	.9	22.2	1.0	11940	.02	.02	1.04			
		4	13.0	38.1	36.3	12.6	5.2	52.8	.7	27.9	.8	8900	---	---	---			

Table 10c.—Proximate, ultimate, Btu, forms-of-sulfur and fusibility of ash analyses of 6 composite samples in part, coal samples from USGS core hole RM-2 SW 1/4 NE 1/4 sec. 32, T. 56 N., R. 72 W., Campbell County, Wyo.

[All analyses except Btu and fusibility of ash in percent. Original moisture content may be slightly more than shown because samples were collected and transported in plastic bags to avoid metal contamination and water was added where necessary to maintain 100 percent humidity within the bag. Form of analyses: 1, as received; 2, moisture free; 3, moisture and ash free; 4, air dried 30-35°C until constant weight achieved. All analyses by U.S. Bureau of Mines, Coal Analysis Section, Pittsburgh, Pa. (---) indicate no data; 1 ft = .305 meters; to convert from degrees Fahrenheit to degrees Centigrade subtract 32° and multiply by 5/9. To convert Btu/lb to Kcal/kg, multiply by 0.5556.]

			Proximate analysis				Ultimate Analysis						Forms of sulfur			Fusibility of Ash (°F)		
Sample	Depth (ft)	Forms of analysis	Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Sulfur	Btu/lb	Sulfate	Pyritic	Organic	Initial deformation	Softening	Fluid
Anderson coal bed 198.4 to 232.6 feet																		
D177704	198.4 - 199.1	1	29.2	28.9	28.6	13.3	6.3	41.6	0.5	37.7	0.6	7020	0.09	0.12	0.43	2130	2200	2290
		2	---	40.8	40.4	18.8	4.3	58.8	.7	16.6	.8	9920	.13	.17	.61			
		3	---	50.3	49.7	---	5.3	72.3	.9	20.4	1.0	12210	.16	.21	.75			
		4	10.2	36.7	36.2	16.9	5.0	52.8	.6	23.9	.8	8920	---	---	---			
D177705, D177707	199.1 - 232.6	1	32.2	29.5	29.6	8.7	6.7	42.6	.6	41.0	.4	7210	.02	.02	.35	2215	2300	2345
		2	---	43.5	43.7	12.8	4.6	62.8	.9	18.3	.6	10630	.03	.03	.52			
		3	---	49.9	50.1	---	5.3	72.1	1.0	20.9	.7	12200	.03	.03	.59			
		4	10.9	36.6	36.8	10.9	5.6	52.9	.7	29.4	.5	8960	---	---	---			
Canyon A coal bed 236.5 to 265.2 feet																		
D177708, D177709	236.5 - 246.4	1	30.2	23.5	25.3	21.0	5.9	34.6	.5	37.2	.8	5780	.10	.14	.57	2350	2420	2520
		2	---	33.7	36.2	30.1	3.6	49.6	.7	14.8	1.1	8280	.14	.29	.82			
		3	---	48.2	51.8	---	5.2	70.9	1.0	21.2	1.6	11840	.20	.29	1.17			
		4	11.8	29.7	32.0	26.5	4.5	43.7	.6	23.7	1.0	7300	---	---	---			
D177710, D177711	249.8 - 265.2	1	34.4	28.2	33.1	4.3	6.9	44.2	.5	43.7	.4	7420	.02	.14	.25	2420	2460	2520
		2	---	43.0	50.5	6.6	4.7	67.4	.8	20.0	.6	11310	.03	.21	.38			
		3	---	46.0	54.0	---	5.0	72.1	.8	21.4	.7	12100	.03	.23	.41			
		4	19.3	34.7	40.7	5.3	5.9	54.4	.7	33.2	.5	9130	---	---	---			
Canyon B coal bed 311.2 to 330.6 feet																		
D177712	311.2 - 213.0	1	33.6	27.8	33.5	5.1	6.9	45.5	.5	41.4	.6	7640	.04	.02	.56	2385	2415	2435
		2	---	41.8	50.4	7.8	4.7	68.4	.8	17.4	.9	11500	.06	.04	.85			
		3	---	45.3	54.7	---	5.1	74.1	.9	18.9	1.0	12460	.06	.04	.92			
		4	15.0	35.5	42.9	6.6	5.7	58.2	.7	26.0	.8	9780	---	---	---			
D177713, D177714	313.0 - 330.6	1	34.1	27.9	33.0	5.0	6.8	44.6	.6	42.7	.3	7440	.02	.02	.29	2250	2310	2340
		2	---	42.3	50.1	7.6	4.6	67.8	.8	18.7	.5	11300	.02	.04	.45			
		3	---	45.8	54.2	---	4.9	73.4	.9	20.3	.5	12240	.03	.04	.48			
		4	14.8	36.1	42.6	6.5	5.5	57.8	.7	29.1	.4	9640	---	---	---			

Table 10d.--Proximate, ultimate, Btu, forms-of-sulfur and fusibility of ash analyses of 7 composite samples from Anderson coal bed USGS core hole RM-3 NW 1/4 NW 1/4 sec. 25, T. 56 N. R. 73 W., Campbell County, Wyo.

[All analyses except Btu and fusibility of ash in percent. Original moisture content may be slightly more than shown because samples were collected and transported in plastic bags to avoid metal contamination and water was added where necessary to maintain 100 percent humidity within the bag. Form of analyses: 1, as received; 2, moisture free; 3, moisture and ash free; 4, air dried 30-35°C until constant weight achieved. All analyses by U.S. Bureau of Mines, Coal Analysis Section, Pittsburgh, Pa. (---) indicate no data; 1 ft = .305 meters; to convert from degrees Fahrenheit to degrees Centigrade subtract 32° and multiply by 5/9. To convert Btu/lb to Kcal/kg, multiply by 0.5556.]

			Proximate analysis				Ultimate Analysis						Forms of sulfur			Fusibility of Ash (°F)		
Sample	Depth (ft)	Forms of analysis	Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Sulfur	Btu/lb	Sulfate	Pyritic	Organic	Initial deformation	Softening	Fluid
D176502, D176503	92.5 - 97.3	1	31.6	29.7	30.0	8.7	6.6	42.8	0.7	40.7	0.5	7160	0.01	0.01	0.47	2130	2160	2190
		2	---	43.4	43.9	12.7	4.5	62.6	1.0	18.4	.7	10470	.01	.01	.69			
		3	---	49.7	50.3	---	5.2	71.7	1.2	21.1	.8	11990	.02	.02	.79			
		4	12.3	38.1	38.5	11.1	5.4	54.8	.9	27.2	.6	9180	---	---	---			
D176504, D176505	97.3 - 102.5	1	30.5	31.8	29.0	8.7	6.4	43.5	.8	40.1	.5	7310	.01	.01	.49	2070	2120	2170
		2	---	45.8	41.7	12.5	4.3	62.6	1.2	18.7	.7	10520	.01	.01	.71			
		3	---	52.3	47.7	---	5.0	71.5	1.3	21.4	.8	12020	.02	.02	.81			
		4	13.8	39.4	36.1	10.7	5.2	53.9	1.0	28.6	.6	9060	---	---	---			
D176506, D176507	102.5 - 107.1	1	31.5	31.9	31.8	4.8	6.6	45.5	.8	41.9	4	7770	.01	.01	.35	2340	2380	2420
		2	---	46.6	46.4	7.0	4.5	66.4	1.2	20.3	.6	11340	.01	.01	.51			
		3	---	50.1	49.9	---	4.9	71.4	1.3	21.8	.6	12200	.02	.02	.55			
		4	14.1	40.0	39.9	6.0	5.4	57.1	1.0	30.0	.5	9740	---	---	---			
D176508, D176509	107.1 - 112.0	1	30.0	33.0	32.2	4.8	6.7	46.7	.8	40.7	.3	7990	.01	.01	.31	2360	2400	2440
		2	---	47.1	46.0	6.9	4.8	66.7	1.1	20.0	.4	11410	.01	.01	.44			
		3	---	50.6	49.4	---	5.2	71.6	1.2	21.5	.5	12250	.02	.02	.48			
		4	13.2	40.9	40.0	5.9	5.6	57.9	1.0	29.2	.4	9910	---	---	---			
D176510, D176511	112.0 - 116.5	1	31.8	29.7	33.7	4.8	6.6	46.0	.7	41.6	.3	7750	.01	.01	.25	2360	2400	2440
		2	---	43.5	49.4	7.0	4.5	67.4	1.0	19.6	.4	11360	.01	.01	.37			
		3	---	46.8	53.2	---	4.8	72.6	1.1	21.0	.5	12220	.02	.02	.39			
		4	14.2	37.3	42.5	6.0	5.4	57.8	.9	29.6	.3	9750	---	---	---			
D176512, D176513, D176514	116.5 - 122.5	1	33.0	30.8	31.8	4.4	6.9	45.0	.8	42.6	.3	7560	.01	.01	.32	2340	2380	2420
		2	---	46.0	47.5	6.6	4.8	67.2	1.2	19.8	.4	11280	.01	.01	.48			
		3	---	49.2	50.8	---	5.2	71.9	1.3	21.2	.5	12080	.02	.02	.51			
		4	12.8	40.0	41.5	5.7	5.7	58.6	1.0	28.6	.4	9840	---	---	---			
D176515	122.5 - 124.5	1	29.2	30.5	16.9	23.4	5.8	32.8	.5	36.9	.6	5520	.01	.02	.59	2360	2460	2540
		2	---	43.1	23.9	33.1	3.6	46.3	.7	15.5	.8	7800	.01	.03	.83			
		3	---	64.3	35.7	---	5.4	69.2	1.1	23.0	1.3	11650	.02	.04	1.24			
		4	10.5	38.6	21.3	29.6	4.4	41.4	.7	23.1	.8	6990	---	---	---			

Table 10e.--Proximate, ultimate, Btu, forms-of-sulfur and fusibility of ash analyses of 10 composite, in part, coal samples from USGS core hole RM-4 SW 1/4 SW 1/4 sec. 25, T. 56 N., R. 73 W., Campbell County, Wyo.

[All analyses except Btu and fusibility of ash in percent. Original moisture content may be slightly more than shown because samples were collected and transported in plastic bags to avoid metal contamination and water was added where necessary to maintain 100 percent humidity within the bag. Form of analyses: 1, as received; 2, moisture free; 3, moisture and ash free; 4, air dried 30-35°C until constant weight achieved. All analyses by U.S. Bureau of Mines, Coal Analysis Section, Pittsburgh, Pa. (---) indicate no data; 1 ft = .305 meters; to convert from degrees Fahrenheit to degrees Centigrade subtract 32° and multiply by 5/9. To convert Btu/lb to Kcal/kg, multiply by 0.5556.]

Sample	Depth (ft)	Form of analysis	Proximate analysis				Ultimate Analysis						Forms of sulfur			Fusibility of Ash (°F)		
			Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Sulfur	Btu/lb	Sulfate	Pyritic	Organic	Initial deformation	Softening	Fluid
Anderson coal bed 129.4 to 167.0 feet																		
D176799	129.4 - 130.0	1	31.6	29.7	32.7	6.1	6.7	45.5	0.7	40.6	0.5	7790	0.01	0.02	0.44	2210	2240	2270
		2	---	43.4	47.8	8.9	4.6	66.5	1.1	18.4	.7	11390	.01	.03	.84			
		3	---	47.6	52.5	---	5.0	72.9	1.2	20.2	.8	12500	.02	.03	.71			
		4	10.5	38.9	42.8	7.8	5.3	59.6	1.0	25.7	.6	10200	---	---	---			
D176800-D176804	130.4 - 163.0	1	32.8	29.7	32.2	5.6	6.8	44.8	.7	41.5	.4	7600	.01	.01	.34	2340	2370	2400
		2	---	43.5	47.9	8.6	4.7	66.7	1.0	18.4	.6	11310	.01	.01	.51			
		3	---	47.6	52.4	---	5.1	73.0	1.1	20.1	.7	12300	.02	.02	.55			
		4	12.5	38.0	42.0	7.5	5.5	58.3	.9	27.3	.5	9890	---	---	---			
D176805	163.0 - 167.0	1	18.8	32.3	31.6	17.4	5.4	45.3	.8	30.4	.7	7730	.01	.03	.67	2330	2360	2390
		2	---	39.8	38.9	21.4	4.1	55.8	1.0	16.9	.9	9520	.01	.04	.83			
		3	---	50.6	49.5	---	5.2	71.0	1.3	21.5	1.1	12120	.02	.05	1.05			
		4	10.6	35.6	34.6	19.2	4.8	49.9	.9	24.4	.8	8520	---	---	---			
Canyon A coal bed 298.0 to 320.5																		
D176806	298.0 - 299.0	1	30.8	27.6	34.5	7.1	6.2	43.9	.8	39.2	2.8	7400	.28	.95	1.55	2310	2340	2370
		2	---	39.9	49.9	10.3	4.0	63.4	1.2	17.1	4.0	10690	.40	1.37	2.24			
		3	---	44.4	55.6	---	4.5	70.7	1.3	19.0	4.5	11920	.45	1.53	2.50			
		4	10.2	35.8	44.8	9.2	4.7	57.0	1.0	24.5	3.6	9600	---	---	---			
D176807	299.0 - 303.0	1	34.2	26.7	31.9	7.2	6.7	42.7	.6	42.2	.6	7170	.01	.02	.58	2020	2050	2080
		2	---	40.6	48.5	10.9	4.4	64.9	.9	17.9	.9	10900	.02	.03	.88			
		3	---	45.6	54.4	---	4.9	72.9	1.0	20.1	1.0	12240	.02	.03	.99			
		4	10.6	36.2	43.4	9.8	5.1	59.0	.9	25.4	.8	9750	---	---	---			
D176808	303.0 - 306.0	1	31.4	28.4	33.0	7.2	6.4	45.0	.7	39.7	1.0	7620	.01	.02	1.00	2020	2050	2080
		2	---	41.4	48.1	10.5	4.2	65.6	1.0	17.2	1.5	11110	.01	.03	1.46			
		3	---	46.3	53.7	---	4.7	73.3	1.1	19.2	1.6	12410	.02	.03	1.63			
		4	12	36.5	42.3	9.2	5.1	57.8	.9	25.8	1.2	9790	---	---	---			
D176809-D176812	306.0 - 320.5	1	34	28	33.9	4.1	6.8	45.1	.8	42.9	.3	7530	.01	.01	.29	2380	2420	2450
		2	---	42.4	51.4	6.2	4.6	68.3	1.2	19.2	.5	11410	.02	.02	.44			
		3	---	45.2	54.8	---	4.9	72.9	1.3	20.5	.5	12160	.02	.02	.47			
		4	10.8	31.8	45.9	5.5	5.3	60.9	1.0	26.9	.4	10170	---	---	---			
Canyon B coal bed 323.0 to 349.0 feet																		
D176813	323.0 - 327.0	1	34.2	27.3	33.8	4.7	6.8	44.7	.6	43.0	.2	7630	.01	.01	.22	2310	2340	2370
		2	---	42.5	51.4	7.1	4.6	67.9	.9	19.1	.3	11290	.02	.02	.36			
		3	---	44.7	55.3	---	4.9	73.2	1.0	20.6	.3	12160	.02	.02	.36			
		4	11.2	36.8	45.6	6.4	5.3	60.3	.9	26.8	.3	10020	---	---	---			
D176814-D176818	327.0 - 346.0	1	35.3	27.8	33.3	3.6	6.8	44.8	.7	43.9	.2	7530	.01	.01	.20	2380	2410	2440
		2	---	43.0	51.5	5.6	4.4	69.2	1.1	19.4	.3	11640	.02	.02	.31			
		3	---	45.5	54.5	---	4.7	73.3	1.1	20.5	.3	12320	.02	.02	.33			
		4	11.2	38.2	45.6	5.0	5.2	61.5	1.0	27.0	.3	10340	---	---	---			
D176819	346.0 - 349.0	1	31.6	30.1	30.1	8.3	6.8	44.0	.7	39.6	.6	7650	.01	.01	.54	2120	2150	2180
		2	---	44.0	44.0	12.12	4.8	64.3	1.0	16.8	.9	11180	.01	.01	.79			
		3	---	50.1	50.1	---	5.5	73.2	1.2	19.2	1.0	12730	.02	.02	.90			
		4	9.7	39.7	39.7	10.9	5.5	58.1	1.0	23.8	.7	10100	---	---	---			

Table 10f.--Proximate, ultimate, Btu, forms-of-sulfur and fusibility of ash analyses of 7 composite, in part, coal samples from USGS core hole RM-5 SE 1/4 SE 1/4 sec. 27, T. 56 N., R. 73 W., Campbell County, Wyo.

[All analyses except Btu and fusibility of ash in percent. Original moisture content may be slightly more than shown because samples were collected and transported in plastic bags to avoid metal contamination and water was added where necessary to maintain 100 percent humidity within the bag. Form of analyses: 1, as received; 2, moisture free; 3, moisture and ash free; 4, air dried 30-35°C until constant weight achieved. All analyses by U.S. Bureau of Mines, Coal Analysis Section, Pittsburgh, Pa. (---) indicate no data; 1 ft = .305 meters; to convert from degrees Fahrenheit to degrees Centigrade subtract 32° and multiply by 5/9. To convert Btu/lb to Kcal/kg, multiply by 0.5556.]

			Proximate analysis				Ultimate Analysis						Forms of sulfur			Fusibility of Ash (°F)		
Sample	Depth (ft)	Forms of analysis	Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Sulfur	Btu/lb	Sulfate	Pyritic	Organic	Initial deformation	Softening	Fluid
Anderson coal bed 135.2 to 168.6 feet																		
D177715	135.2 - 136.2	1	34.0	27.1	28.2	10.7	6.6	40.6	0.6	40.9	0.6	6900	0.02	0.02	0.58	2115	2200	2250
		2	---	41.1	42.7	16.2	4.0	61.5	.9	16.2	.9	10450	.03	.03	.88			
		3	---	49.0	51.0	---	5.1	73.4	1.1	19.3	1.1	12480	.04	.04	1.05			
		4	15.1	34.8	36.4	13.7	5.4	52.3	.8	27.0	.8	8870	---	---	---			
D177716-D177719	136.2 - 165.6	1	35.5	27.6	30.9	6.0	7.0	42.4	.6	43.6	.4	7150	.02	.11	.28	2255	2290	2330
		2	---	42.8	47.9	9.3	4.7	65.7	.9	18.7	.6	11090	.03	.17	.43			
		3	---	47.2	52.8	---	5.2	72.5	1.0	20.6	.7	12220	.03	.19	.48			
		4	15.6	36.2	40.4	7.8	5.7	55.5	.8	29.7	.5	9360	---	---	---			
D177720	165.6 - 168.6	1	35.3	24.8	24.2	15.7	6.5	34.9	.3	41.7	.9	5910	.02	.02	.83	2310	2370	2420
		2	---	38.3	37.4	24.3	4.0	53.9	.5	16.0	1.4	9130	.03	.03	1.28			
		3	---	50.6	49.4	---	5.3	71.2	.6	21.1	1.8	12060	.04	.04	1.69			
		4	17.0	31.9	31.0	20.1	5.2	44.8	.6	28.4	1.1	7590	---	---	---			
Canyon coal bed 354.9 to 395.5 feet																		
D177721, D177722	354.9 - 360.2	1	32.5	28.7	32.9	5.9	6.6	45.1	.4	41.3	.7	7580	.02	.02	.67	2345	2380	2400
		2	---	42.5	48.7	8.7	4.4	66.8	.6	18.4	1.0	11230	.03	.03	.99			
		3	---	46.6	53.4	---	4.9	73.2	.6	20.1	1.1	12310	.03	.03	1.09			
		4	15.4	36.1	41.1	7.4	5.5	56.6	.5	29.1	.9	9510	---	---	---			
D177723	360.2 - 361.8	1	19.1	11.7	9.8	59.4	3.3	14.2	.3	22.5	.3	2290	.01	.07	.18	2880	2910+	---
		2	---	14.5	12.1	73.4	1.5	17.6	.4	6.8	.4	2830	.01	.09	.22			
		3	---	---	---	---	---	---	---	---	---	---	---	---	---			
		4	3.3	14.0	11.7	71.0	1.8	17.0	.4	9.5	.3	2740	---	---	---			
D177724-D177726	361.8 - 375.9	1	32.5	26.6	29.6	11.3	6.5	40.6	.7	40.6	.3	6880	.01	.04	.27	2250	2300	2350
		2	---	39.4	43.9	16.7	4.3	60.1	1.0	17.3	.4	10190	.01	.06	.40			
		3	---	47.3	52.7	---	5.1	72.2	1.2	20.8	.5	12240	.02	.07	.48			
		4	10.0	35.4	39.6	15.10	4.9	54.1	.9	24.7	.4	9170	---	---	---			
D177727-D177729	375.9 - 395.5	1	33.1	27.2	32.9	6.8	6.6	44.2	.7	41.2	.5	7440	.01	.16	.33	2150	2200	2250
		2	---	40.7	49.2	10.2	4.4	66.1	1.0	17.6	.7	11120	.01	.24	.49			
		3	---	45.3	54.7	---	4.9	73.5	1.2	19.6	.8	12380	.02	.27	.55			
		4	10.5	36.4	44.0	9.1	5.1	59.1	1.0	25.0	.7	9950	---	---	---			

Table 10g.--Proximate, ultimate, Btu, forms-of-sulfur and fusibility of ash analyses of 8 composite, in part, coal samples from USGS core hole RM-6 NW 1/4 NE 1/4 sec. 21, T. 56 N., R. 73 W., Campbell County, Wyo.

[All analyses except Btu and fusibility of ash in percent. Original moisture content may be slightly more than shown because samples were collected and transported in plastic bags to avoid metal contamination and water was added where necessary to maintain 100 percent humidity within the bag. Form of analyses: 1, as received; 2, moisture free; 3, moisture and ash free; 4, air dried 30-35°C until constant weight achieved. All analyses by U.S. Bureau of Mines, Coal Analysis Section, Pittsburgh, Pa. (---) indicate no data; 1 ft = .305 meters; to convert from degrees Fahrenheit to degrees Centigrade subtract 32° and multiply by 5/9. To convert Btu/lb to Kcal/kg, multiply by 0.5556.]

			Proximate analysis				Ultimate Analysis						Forms of sulfur			Fusibility of Ash (°F)		
Sample	Depth (ft)	Form of analysis	Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Sulfur	Btu/lb	Sulfate	Pyritic	Organic	Initial deformation	Softening	Fluid
Anderson coal bed 88.9 to 120.0 feet																		
D177730	88.9 - 90.4	1	30.9	28.9	31.2	9.0	6.5	43.3	0.7	40.0	0.5	7370	0.01	0.02	0.50	2190	2220	2250
		2	---	41.8	45.2	13.0	4.4	62.7	1.0	18.1	.7	10670	.01	.03	.72			
		3	---	48.1	51.9	---	5.1	72.0	1.2	20.9	.8	12260	.02	.03	.83			
		4	10.2	37.5	40.6	11.7	5.2	56.2	.9	25.3	.7	9580	---	---	---			
D177731	90.4 - 97.7	1	33.0	28.1	30.4	8.5	6.7	42.1	.7	41.4	.6	7140	.01	.03	.56	2070	2120	2180
		2	---	41.9	45.4	12.7	4.5	62.8	1.0	18.0	.9	10660	.01	.04	.84			
		3	---	48.0	52.0	---	5.2	72.0	1.2	20.6	1.0	12210	.02	.05	.96			
		4	12.0	36.9	40.0	11.1	5.3	55.3	1.0	26.5	.8	9380	---	---	---			
D177732, D177733	97.7 - 116.9	1	31.4	29.7	31.5	7.4	6.7	44.1	.7	40.6	.5	7500	.01	.07	.40	2200	2230	2260
		2	---	43.3	45.9	10.8	4.7	64.3	1.0	18.5	.7	10930	.01	.10	.58			
		3	---	48.5	51.5	---	5.2	72.1	1.1	20.7	.8	12250	.02	.11	.65			
		4	10.3	38.9	41.1	9.7	5.3	57.7	1.0	25.7	.6	9810	---	---	---			
D177734	116.9 - 120.0	1	33.7	27.6	32.1	6.6	6.7	43.1	.7	42.2	.7	7260	.00	.01	.64	2360	2390	2440
		2	---	41.6	48.4	10.0	4.5	65.0	1.1	18.5	1.1	10950	.00	.02	.97			
		3	---	46.2	53.8	---	5.0	72.2	1.2	20.5	1.2	12160	.00	.02	1.07			
		4	9.9	37.5	43.7	8.9	5.2	58.5	1.0	25.5	.9	9850	---	---	---			
Canyon coal bed 256.5 to 302.7 feet																		
D177735, D177736	265.5 - 261.2	1	34.3	26.1	31.1	8.5	6.7	41.3	.4	42.6	.5	6990	.01	.04	.47	2200	2230	2260
		2	---	39.7	47.3	12.9	4.4	62.9	.6	18.4	.8	10640	.02	.06	.72			
		3	---	45.6	54.4	---	5.1	72.2	.7	21.2	.9	12220	.02	.07	.82			
		4	9.9	35.8	42.7	11.6	5.0	56.6	.6	25.5	.7	9590						
D177737	272.1 - 272.7	1	25.6	21.4	21.0	32.0	5.0	28.0	.6	32.9	1.5	4690	.25	.70	.55	2340	2460	2730
		2	---	28.8	28.2	43.0	2.9	37.6	.8	13.6	2.0	6300	.34	.94	.74			
		3	---	50.5	49.5	---	5.1	66.0	1.4	23.9	3.5	11060	.59	1.65	1.30			
		4	7.5	26.6	26.1	39.8	3.5	34.9	.8	19.1	1.9	5840	---	---	---			
D177738, D177739	272.7 - 297.9	1	31.9	26.6	32.5	9.0	6.4	43.2	.8	40.3	.3	7270	.03	.08	.20	2200	2230	2260
		2	---	39.1	47.7	13.2	4.2	63.4	1.2	17.5	.4	10680	.04	.12	.29			
		3	---	45.0	55.0	---	4.8	73.1	1.4	20.2	.5	12300	.05	.14	.34			
		4	10.8	34.9	42.5	11.8	4.9	56.6	1.0	25.3	.4	9530	---	---	---			
D177740	297.9 - 302.7	1	32.7	26.4	36.9	4.0	6.5	46.5	.6	42.2	.2	7790	.02	.05	.18	2390	2490	2545
		2	---	39.2	54.8	5.9	4.3	69.1	.9	19.5	.3	11580	.03	.07	.27			
		3	---	41.7	58.3	---	4.5	73.5	.9	20.7	.3	12310	.03	.08	.28			
		4	15.0	33.4	46.5	5.1	5.3	58.7	.8	29.8	.3	9840	---	---	---			

Table 10h.--Proximate, ultimate, Btu, forms-of-sulfur and fusibility of ash of 9 composite, in part, coal samples from USGS core hole RM-7 NE 1/4 NW 1/4 sec. 26, T. 56 N., R. 73 W., Campbell County, Wyo.

[All analyses except Btu and fusibility of ash in percent. Original moisture content may be slightly more than shown because samples were collected and transported in plastic bags to avoid metal contamination and water was added where necessary to maintain 100 percent humidity within the bag. Form of analyses: 1, as received; 2, moisture free; 3, moisture and ash free; 4, air dried 30-35°C until constant weight achieved. All analyses by U.S. Bureau of Mines, Coal Analysis Section, Pittsburgh, Pa. (---) indicate no data; 1 ft = .305 meters; to convert from degrees Fahrenheit to degrees Centigrade subtract 32° and multiply by 5/9. To convert Btu/lb to Kcal/kg, multiply by 0.5556.]

Sample	Depth (ft)	Forms of analysis	Proximate analysis				Ultimate Analysis						Forms of sulfur			Fusibility of Ash (°F)		
			Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Sulfur	Btu/lb	Sulfate	Pyritic	Organic	Initial deformation	Softening	Fluid
Anderson coal bed 133.2 to 170.3 feet																		
D177741	133.2 - 134.0	1	41.5	25.3	28.3	4.9	7.2	38.8	0.4	48.3	0.4	6580	0.01	0.04	0.36	2230	2255	2275
		2	---	43.2	48.4	8.4	4.4	66.3	.7	19.5	.7	11250	.02	.07	.62			
		3	---	47.2	52.8	---	4.8	72.4	.7	21.3	.7	12280	.02	.07	.67			
		4	14.1	37.1	41.6	7.2	5.4	57.1	.5	29.2	.6	9660	---	---	---			
D177742, D177743	134.0 - 154.0	1	33.4	29.0	32.4	5.2	6.8	44.2	.6	42.8	0.4	7500	.02	.05	.29	2350	2375	2385
		2	---	43.5	48.6	7.8	4.6	66.4	.9	19.7	.6	11260	.03	.08	.44			
		3	---	47.2	52.8	---	5.0	72.0	1.0	21.4	.7	12210	.03	.08	.47			
		4	16.5	36.3	40.7	6.5	5.7	55.4	.8	31.2	.4	9400	---	---	---			
D177744, D177745	154.0 - 170.3	1	35.5	26.8	32.1	5.6	6.9	42.6	0.4	44.1	0.4	7180	.02	.05	.33	2240	2260	2275
		2	---	41.6	49.8	8.7	4.6	66.0	.6	19.4	.6	11130	.03	.08	.51			
		3	---	45.5	54.5	---	5.0	72.3	.7	21.3	.7	12190	.03	.08	.56			
		4	17.0	34.4	41.3	7.3	5.7	54.8	.5	31.2	.5	9240	---	---	---			
Canyon coal bed 286.2 to 329.6 feet																		
D177746	286.2 - 287.3	1	30.0	27.2	30.5	12.3	5.8	40.4	0.5	37.4	3.6	6910	.37	3.09	.15	1965	2040	2075
		2	---	38.9	43.6	17.6	3.5	57.7	.7	15.3	5.1	9870	.53	4.41	.21			
		3	---	47.1	52.9	---	4.3	70.0	.9	18.6	6.2	11980	.64	5.36	.26			
		4	12.9	33.9	37.4	15.3	4.5	50.3	.6	24.8	4.5	8590	---	---	---			
D177747	287.3 - 297.3	1	33.5	27.1	34.2	5.2	6.5	44.8	.7	42.4	.4	7550	.02	.10	.25	2220	2270	2285
		2	---	40.8	51.4	7.8	4.2	67.4	1.1	19.0	.6	11350	.03	.15	.38			
		3	---	44.2	55.8	---	4.5	73.1	1.1	20.6	.7	12320	.03	.16	.41			
		4	16.3	34.1	43.1	5.5	5.3	56.4	.8	30.5	.5	9510	---	---	---			
D177748, D177749	299.2 - 317.7	1	33.6	27.4	35.0	4.0	7.0	46.6	.7	41.6	.1	7780	.02	.05	.07	2450	2485	2500
		2	---	41.3	52.7	6.0	4.9	70.2	1.1	17.7	.2	11720	.03	.08	.11			
		3	---	43.9	56.1	---	5.2	74.7	1.1	18.8	.2	12470	.03	.08	.11			
		4	13.9	35.5	45.4	5.2	5.7	60.4	.9	27.6	.2	10080	---	---	---			
D177750	317.7 - 326.0	1	34.6	26.8	33.9	4.7	6.9	44.8	.6	42.6	.4	7570	.02	.05	.31	2335	2370	2390
		2	---	41.0	51.8	7.2	4.7	68.5	.9	18.1	.6	11570	.03	.08	.47			
		3	---	44.2	55.8	---	5.0	73.8	1.0	19.5	.7	12470	.03	.08	.51			
		4	15.0	34.8	44.1	6.1	5.6	58.2	.8	28.8	.5	9840	---	---	---			
D177751	326.0 - 329.6	1	31.8	27.1	28.1	13.0	6.4	39.5	.5	40.0	.6	6770	.02	.11	.45	2330	2370	2405
		2	---	39.7	41.2	19.1	4.2	57.9	.7	17.2	.9	9930	.03	.16	.66			
		3	---	49.1	50.9	---	5.2	71.6	.9	21.3	1.1	12260	.04	.20	.82			
		4	14.3	34.0	35.3	16.4	5.3	49.6	.6	27.4	.7	8510	---	---	---			
Cook coal bed 369.6 to 382.0																		
D177752	369.6 - 382.0	1	31.7	27.0	29.4	11.9	6.3	41.7	.6	39.2	.3	7000	.02	.17	.14	2075	2180	2306
		2	---	39.5	43.0	17.4	4.1	61.1	.9	16.1	.4	10250	.03	.25	.20			
		3	---	47.9	52.1	---	4.9	73.9	1.1	19.5	.5	12410	.04	.30	.25			
		4	14.9	33.6	36.7	14.8	5.2	52.0	.7	26.9	.4	8720	---	---	---			

Table 11.--Weighted average values by hole and coal bed for the analysis shown on tables 7a to 7g, Content of seven trace elements, USGS 1975 Drilling, Campbell County, Wyoming

[All values in ppm. Leaders (---) indicate no data]

Hole no.	Coal bed	As	F	Hg	Sb	Se	Th	U
RM-1	Anderson	1	---	0.13	---	0.9	---	---
	Canyon A	2	65	.09	---	.8	---	---
RM-2	Anderson	1	100	.10	---	.9	---	---
	Canyon A	2	75	.09	---	1.1	---	---
	Canyon B	1	50	.05	---	.4	---	---
RM-3	Anderson		---	.11	.3	1.3	---	---
RM-4	Anderson	1	50	.11	---	1.2	---	.6
	Canyon A	2	55	.07	---	.7	---	.6
	Canyon B	2	50	---	---	.8	---	---
RM-5	Anderson	2	55	.10	---	1.1	---	---
	Canyon	3	---	.08	---	.7	---	1.0
RM-6	Anderson	3	50	.11	.3	1.5	---	---
	Canyon	4	70	.07	.3	1.2	---	1.0
RM-7	Anderson	1	50	.07	---	1.1	---	---
	Canyon	3	---	.08	---	.8	---	---
	Cook	1	60	.08	.3	.9	---	1.2

Table 12.--Weighted average values by hole and coal bed for the analyses shown on Tables 8a to 8p, Major and minor oxide and trace element composition as posted on a whole-coal basis, USGS 1975 Drilling, Campbell County, Wyoming

[Leaders (---) indicate no data]

Hole no.	Coal bed	Si %	Al %	Ca %	Mg %	Na %	K %	Fe %	Mn ppm	Ti %	P ppm
RM-1	Anderson	1.2	0.74	1.5	0.259	0.126	0.040	0.30	9.7	0.047	---
	Canyon A	.92	.58	1.3	.276	.121	.039	.24	11	.038	390
RM-2	Anderson	1.7	.84	1.1	.284	.136	.050	.20	---	.064	---
	Canyon A	2.7	1.3	.90	.285	.122	.078	.31	---	.077	---
	Canyon B	.50	.31	.93	.289	.112	.012	.47	---	.017	---
RM-3	Anderson	1.4	.82	1.7	.326	.120	.048	.31	61	.054	1000
RM-4	Anderson	.92	.70	1.0	.333	.161	.029	.24	---	.063	---
	Canyon A	.72	.41	.92	.285	.159	.017	.36	---	.052	---
	Canyon B	.74	.50	.85	.274	.145	.021	.41	---	.032	---
RM-5	Anderson	1.1	.54	.86	.220	.125	.031	.18	---	.042	---
	Canyon	2.1	.71	.97	.284	.141	.066	.28	---	.048	---
RM-6	Anderson	1.6	1.1	1.6	.378	.231	.040	.35	71	.078	---
	Canyon	1.8	1.0	1.1	.295	.152	.081	.38	91	.053	---
RM-7	Anderson	.76	.48	1.1	.300	.148	.015	.19	---	.043	---
	Canyon	.94	.53	1.2	.345	.145	.026	.40	---	.041	---
	Cook	2.6	1.0	.97	.296	.114	.087	.28	---	.065	---

Hole no.	Coal bed	As ppm	Cu ppm	F ppm	Hg ppm	Li ppm	Pb ppm	Sb ppm	Se ppm	U ppm	Zn ppm
RM-1	Anderson	-	12.0	---	0.13	---	---	---	0.9	1.0	10.3
	Canyon A	2	10.4	66	.09	---	---	---	.8	---	8.8
RM-2	Anderson	1	15.1	101	.10	3.2	---	---	.9	---	9.5
	Canyon A	2	21.5	76	.09	---	---	---	1.1	---	24.5
	Canyon B	1	3.9	48	.05	---	---	---	.4	---	2.3
RM-3	Anderson	-	15.6	---	.11	---	---	.3	1.3	---	6.5
RM-4	Anderson	1	12.8	48	.10	---	2.9	---	1.2	.6	13.6
	Canyon A	2	8.2	55	.07	---	---	---	.7	.6	12.1
	Canyon B	2	5.7	46	---	---	---	---	.8	---	13.4
RM-5	Anderson	2	9.3	53	.10	3.2	---	---	1.1	---	6.1
	Canyon	3	8.8	---	.08	---	---	---	.7	1.0	6.9
RM-6	Anderson	3	22.4	49	.11	7.1	4.3	.3	1.5	---	12.2
	Canyon	4	10.9	72	.07	---	---	.3	1.2	1.0	13.7
RM-7	Anderson	1	11.1	51	.07	2.2	2.4	---	1.1	---	4.3
	Canyon	3	8.3	---	.08	---	---	---	.8	---	3.9
	Cook	1	9.9	59	.08	3.8	---	.3	.9	1.2	9.3

Table 12.--Weighted average values by hole and coal bed for the analyses shown on Tables 8a to 8p, Major and minor oxide and trace element composition as posted on a whole-coal basis, USGS 1975 Drilling, Campbell County, Wyoming--Continued

Hole no.	Coal bed	B ppm-S	Ba ppm-S	Be ppm-S	Co ppm-S	Cr ppm-S	Ga ppm-S	Mo ppm-S	Nb ppm-S	Ni ppm-S	Sc ppm-S
RM-1	Anderson	30	500	---	1.5	10	2	---	---	5	3
	Canyon A	50	200	---	1.0	7	2	1	---	3	2
RM-2	Anderson	70	700	---	1.5	10	5	1	---	3	3
	Canyon A	70	500	---	---	20	7	3	---	2	---
	Canyon B	70	700	---	---	2	1.5	.5	---	2	---
RM-3	Anderson	50	700	---	1.5	2	3	---	---	3	2
RM-4	Anderson	50	300	---	1.5	5	2	---	---	2	1.5
	Canyon A	50	500	---	1.5	5	2	1	---	5	1.5
	Canyon B	50	300	---	---	3	1	.5	---	3	---
RM-5	Anderson	70	500	---	1.0	7	3	1.5	---	2	1.5
	Canyon	70	700	---	---	7	5	---	---	-	1.5
RM-6	Anderson	100	700	---	1.5	15	7	1.5	3.0	5	3.0
	Canyon	70	500	---	---	10	3	1.5	---	5	---
RM-7	Anderson	70	500	---	1.0	5	2	---	---	1.5	2
	Canyon	70	700	---	---	7	5	---	---	2	1.5
	Cook	100	700	1.12	1.84	15	5	---	3.0	3	3

Hole no.	Coal bed	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zr ppm-S
RM-1	Anderson	100	20	5	.5	15
	Canyon A	100	15	7	.5	10
RM-2	Anderson	100	30	5	.7	15
	Canyon A	300	50	10	1.0	20
	Canyon B	150	7	3	.5	7
RM-3	Anderson	150	20	5	.5	20
RM-4	Anderson	50	20	3	.3	15
	Canyon A	70	15	7	.5	15
	Canyon B	50	10	-	---	10
RM-5	Anderson	100	20	5	.7	20
	Canyon	150	20	7	.7	20
RM-6	Anderson	150	30	7	.7	15
	Canyon	170	30	7	.7	15
RM-7	Anderson	100	20	5	.5	10
	Canyon	150	20	5	.5	15
	Cook	170	30	10	1.0	20

Table 13.--Weighted average values by hole and coal bed for the analysis shown on Tables 9a to 9p, Major and Minor oxide and trace element composition of laboratory ash, USGS 1975 drilling, Campbell County, Wyo.

[Leaders (---) indicate no data]

Hole no.	Coal bed	Ash %	SiO_2 %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Fe_2O_3 %	MnO %	TiO_2 %
RM-1	Anderson	8.9	22	13	28	5.66	2.34	0.45	5.2	0.017	0.82
	Canyon A	8.0	21	12	25	6.39	2.25	.51	4.7	.021	.71
RM-2	Anderson	10.4	32	13	17	5.05	1.99	.48	2.9	---	1.1
	Canyon A	14.1	30	14	14	5.09	1.86	.46	3.9	---	.80
	Canyon B	7.3	15	8.1	18	6.62	2.08	.20	9.4	---	.39
RM-3	Anderson	10.1	22	13	29	6.26	1.98	.39	4.7	.094	.82
RM-4	Anderson	8.5	19	14	19	7.17	2.87	.30	4.2	---	1.3
	Canyon A	7.3	19	11	19	6.96	3.20	.26	6.8	---	1.1
	Canyon B	7.0	19	12	19	7.05	3.09	.31	9.3	---	.69
RM-5	Anderson	7.7	27	13	17	5.04	2.33	.35	3.5	---	1.0
	Canyon	11.1	22	11	19	6.35	2.61	.35	4.9	---	.69
RM-6	Anderson	13.3	26	15	16	4.61	2.29	.39	3.7	.068	.99
	Canyon	11.2	28	15	17	5.21	2.25	.63	5.3	.13	.73
RM-7	Anderson	7.2	22	13	21	6.93	2.79	.25	3.8	---	.98
	Canyon	8.8	19	10	20	7.15	2.45	.26	6.9	---	.72
	Cook	12.6	36	13	15	5.02	1.69	.50	3.5	---	.86

Hole no.	Coal bed	P_2O_5 %	SO_3 %	Cu ppm	Li ppm	Pb ppm	Zn ppm	B ppm-S	Ba ppm-S	Be ppm-S	Co ppm-S
RM-1	Anderson	---	4.7	135	---	---	74	500	5,000	---	15
	Canyon A	.95	6.5	120	---	---	86	500	3,000	---	15
RM-2	Anderson	---	9.5	152	26	---	77	700	7,000	---	15
	Canyon A	---	12	147	---	---	120	700	5,000	---	15
	Canyon B	---	13	53	---	---	31	1,000	10,000	---	---
RM-3	Anderson	2.6	13	147	---	---	55	700	7,000	---	15
RM-4	Anderson	---	13	155	---	34	137	700	5,000	---	15
	Canyon A	---	13	115	---	---	158	700	5,000	---	20
	Canyon B	---	11	70	---	---	169	700	5,000	---	---
RM-5	Anderson	---	13	133	49	---	60	1,000	5,000	---	10
	Canyon	---	12	89	---	---	64	1,000	10,000	---	---
RM-6	Anderson	---	13	168	54	33	92	700	7,000	---	15
	Canyon	---	7.5	84	---	---	91	700	5,000	---	---
RM-7	Anderson	---	11	151	31	33	59	1,000	7,000	---	10
	Canyon	---	11	83	---	---	40	1,000	7,000	---	---
	Cook	---	9.8	95	26	---	53	1,000	7,000	---	15

Table 13.--Weighted average values by hole and coal bed for the analysis shown on Tables 9a to 9p, Major and Minor oxide and trace element composition of laboratory ash, USGS 1975 drilling, Campbell County, Wyo.--Continued

Hole no.	Coal bed	Cr ppm-S	Ga ppm-S	Mo ppm-S	Nb ppm-S	Ni ppm-S	Sc ppm-S	Sr ppm-S	V ppm-S
RM-1	Anderson	70	20	--	--	30	20	1,500	200
	Canyon A	70	20	10	--	30	20	1,500	200
RM-2	Anderson	70	50	7	--	20	20	1,500	200
	Canyon A	100	30	15	--	50	20	2,000	200
	Canyon B	50	20	7	--	50	--	2,000	100
RM-3	Anderson	70	30	--	--	30	20	1,500	200
RM-4	Anderson	50	20	--	--	30	20	700	200
	Canyon A	70	20	15	--	50	20	1,000	200
	Canyon B	30	15	7	--	50	--	700	100
RM-5	Anderson	70	30	15	--	30	20	1,500	200
	Canyon	50	30	--	--	--	15	2,000	150
RM-6	Anderson	100	50	15	20	30	30	1,000	300
	Canyon	70	30	20	--	50	--	1,500	200
RM-7	Anderson	70	30	--	--	20	30	1,500	300
	Canyon	70	30	--	--	20	15	2,000	200
	Cook	100	30	--	30	30	30	2,000	200

Hole no.	Coal bed	Y ppm-S	Yb ppm-S	Zr ppm-S
RM-1	Anderson	50	5	150
	Canyon A	70	5	150
RM-2	Anderson	50	7	150
	Canyon A	50	7	150
	Canyon B	50	7	100
RM-3	Anderson	30	5	150
RM-4	Anderson	30	3	150
	Canyon A	70	7	200
	Canyon B	---	-	150
RM-5	Anderson	50	5	150
	Canyon	50	7	150
RM-6	Anderson	50	7	150
	Canyon	50	7	150
RM-7	Anderson	70	7	150
	Canyon	50	5	150
	Cook	100	7	200

Table 14. Weighted average values by hole and coal bed for proximate, ultimate, Btu, forms of sulfur and fusibility of ash analysis shown on Tables 10a to 10h; USGS 1975 Drilling, Campbell County, Wyo.

[All analyses except Btu and fusibility of ash in percent. Original moisture content may be slightly more than shown because samples were collected and transported in plastic bags to avoid metal contamination and water was added where necessary to maintain 100 percent humidity within the bag. Form of analyses: 1, as received; 2, moisture free; 3, moisture and ash free; 4, air dried 30-35°C until constant weight achieved. All analyses by U.S. Bureau of Mines, Coal Analysis Section, Pittsburgh, Pa. (---) indicate no data; 1 ft = .305 meters; to convert from degrees Fahrenheit to degrees Centigrade subtract 32° and multiply by 5/9. To convert Btu/lb to Kcal/kg, multiply by 0.5556.]

			Proximate analysis				Ultimate Analysis						Forms of sulfur			Fusibility of Ash (°F)		
Hole no.	Coal bed	Forms of analysis	Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Sulfur	Btu/lb	Sulfate	Pyritic	Organic	Initial deformation	Softening	Fluid
RM-1	Anderson	1	32.0	29.9	32.4	5.7	6.7	44.8	0.6	41.7	0.4	7563	0.01	0.02	0.39	2280	2310	2340
		2	---	44.0	47.7	8.4	4.6	65.9	.9	19.5	.6	11120	.02	.03	.57			
		3	---	48.0	52.0	---	5.1	71.9	1.0	21.3	.7	12140	.02	.04	.62			
		4	12.6	38.5	41.7	7.3	5.5	57.6	.8	28.8	.5	9728	---	---	---			
	Canyon A	1	32.6	29.2	32.4	5.7	6.7	44.8	.6	41.7	.5	7507	.01	.02	.46	2300	2330	2360
		2	---	43.4	48.1	8.5	4.5	66.5	.9	18.8	.7	11140	.01	.03	.69			
		3	---	47.4	52.6	---	4.9	72.7	1.0	20.6	.8	12180	.02	.03	.75			
		4	13.3	37.6	41.6	7.4	5.4	57.6	.8	28.1	.6	9657	---	---	---			
RM-2	Anderson	1	32.1	29.5	29.6	8.8	6.7	42.6	.6	40.9	.4	7206	.02	.02	.35	2180	2210	2240
		2	---	43.5	43.6	13.0	4.6	62.7	.9	18.2	.6	10620	.03	.03	.52			
		3	---	49.9	50.1	---	5.3	72.1	1.0	20.9	.7	12200	.04	.04	.60			
		4	10.9	36.6	36.8	11.0	5.6	52.9	.7	29.3	.5	8939	---	---	---			
	Canyon A	1	32.8	26.4	30.0	10.8	6.5	40.4	.5	41.2	.6	6778	.05	.14	.38	2390	2440	2520
		2	---	39.2	44.7	16.1	4.3	60.1	.7	17.9	.8	10080	.08	.21	.56			
		3	---	46.7	53.3	---	5.1	71.7	.9	21.3	1.0	12120	.09	.25	.67			
		4	16.4	32.7	37.3	13.6	5.4	50.2	.7	29.5	.7	8413	---	---	---			
	Canyon B	1	34.1	27.9	33.0	5.0	6.8	44.7	.6	42.6	.3	7458	.02	.02	.32	2265	2325	2350
		2	---	42.3	50.1	7.6	4.6	67.8	.9	18.7	.5	11310	.03	.03	.48			
		3	---	45.8	54.2	---	5.0	73.3	1.0	20.2	.5	12240	.04	.03	.52			
		4	14.8	36.0	42.6	6.5	5.5	57.8	.7	29.0	.4	9652	---	---	---			
RM-3	Anderson	1	31.3	31.1	30.7	6.8	6.6	44.4	.8	41.1	.4	7491	.01	.01	.38	2270	2310	2350
		2	---	45.3	44.8	9.9	4.5	64.6	1.1	19.3	.6	10910	.01	.02	.55			
		3	---	50.3	49.7	---	5.0	71.7	1.2	21.4	.6	12110	.02	.02	.61			
		4	13.2	39.3	38.9	8.5	5.4	56.0	1.0	28.6	.5	9466	---	---	---			
RM-4	Anderson	1	31.3	29.5	32.1	7.1	6.6	44.2	.7	39.6	.4	7617	.01	.01	.38	2340	2370	2400
		2	---	43.0	46.8	10.3	4.5	64.3	1.0	17.2	.6	11080	.01	.02	.55			
		3	---	47.9	52.1	---	5.0	71.7	1.2	19.2	.7	12350	.02	.02	.61			
		4	12.3	37.8	41.2	8.8	5.4	57.4	.9	27.0	.5	9747	---	---	---			
	Canyon A	1	33.8	27.7	33.5	5.0	6.7	44.6	.8	42.4	.5	7457	.02	.06	.44	2300	2330	2360
		2	---	41.9	50.6	7.6	4.5	67.3	1.1	18.8	.8	11260	.03	.09	.67			
		3	---	45.3	54.7	---	4.9	72.8	1.2	20.3	.8	12180	.04	.10	.72			
		4	10.8	33.1	45.2	6.7	5.2	60.0	1.0	26.4	.7	10041	---	---	---			
	Canyon B	1	34.7	28.0	33.0	4.3	6.8	44.7	.7	43.3	.2	7528	.01	.01	.24	2340	2370	2400
		2	---	42.9	50.6	6.6	4.5	68.4	1.0	19.0	.4	11530	.02	.02	.37			
		3	---	45.9	54.1	---	4.8	73.3	1.1	20.4	.4	12340	.02	.02	.40			
		4	11.0	38.2	44.9	5.9	5.3	60.9	1.0	26.6	.3	10263	---	---	---			

Table 14. Weighted average values by hole and coal bed for proximate, ultimate, Btu, forms of sulfur and fusibility of ash analysis shown on Tables 10a to 10h; USGS 1975 Drilling, Campbell County, Wyo.--Continued

Hole no.	Coal bed	Forms of analysis	Proximate analysis				Ultimate Analysis					Btu/lb	Forms of sulfur			Fusibility of Ash (°F)		
			Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Sulfur		Sulfate	Pyritic	Organic	Initial deformation	Softening	Fluid
RM-5	Anderson	1	35.4	27.3	30.2	7.0	6.9	41.7	0.6	43.3	0.5	7031	0.02	0.10	0.34	2260	2300	2340
		2	---	42.3	46.8	10.9	4.7	64.5	.9	18.4	.7	10890	.03	.15	.52			
		3	---	47.5	52.5	---	5.2	72.4	1.0	20.6	.8	12220	.03	.17	.59			
		4	15.7	35.8	39.4	9.1	5.6	54.4	.8	29.5	.6	9186	---	---	---			
	Canyon	1	32.2	26.5	30.7	10.6	6.4	41.7	.6	40.2	.5	7034	.01	.10	.35	2240	2290	2340
		2	---	39.1	45.3	15.6	4.2	61.5	1.0	17.0	.7	10380	.02	.14	.51			
		3	---	46.3	53.7	---	5.0	72.9	1.1	20.2	.8	12290	.02	.17	.60			
		4	10.6	35.0	40.7	13.7	4.9	55.2	.9	24.7	.6	9304	---	---	---			
RM-6	Anderson	1	32.0	29.1	31.3	7.7	6.7	43.5	.7	40.9	.5	7385	.00	.05	.47	2185	2215	2255
		2	---	42.7	46.0	11.3	4.6	63.9	1.0	18.4	.8	10860	.00	.08	.69			
		3	---	48.2	51.8	---	5.2	72.1	1.2	20.7	.9	12230	.00	.09	.77			
		4	10.7	38.2	41.1	10.0	5.3	57.1	1.0	25.8	.7	9701	---	---	---			
	Canyon	1	32.2	26.4	32.7	8.6	6.4	43.1	.7	40.7	.3	7259	.03	.08	.24	2230	2265	2310
		2	---	39.0	48.3	12.8	4.2	63.6	1.1	17.8	.5	10710	.04	.12	.35			
		3	---	44.7	55.3	---	4.8	72.9	1.2	20.5	.6	12280	.05	.14	.40			
		4	11.2	34.7	42.8	11.3	4.9	56.5	.9	25.8	.5	9517	---	---	---			
RM-7	Anderson	1	34.5	28.0	32.2	5.4	6.9	43.4	.5	43.5	.4	7339	.02	.05	.31	2300	2320	2335
		2	---	42.7	49.1	8.2	4.6	66.2	.8	19.6	.6	11200	.03	.08	.47			
		3	---	46.5	53.5	---	5.0	72.1	.8	21.3	.7	12210	.03	.08	.51			
		4	16.7	35.5	41.0	6.9	5.7	55.2	.7	31.2	.4	9335	---	---	---			
	Canyon	1	33.5	27.2	33.9	5.4	6.8	45.0	.7	41.8	.4	7573	.03	.14	.20	2350	2385	2400
		2	---	40.9	51.0	8.1	4.6	67.8	1.0	18.0	.5	11390	.04	.21	.30			
		3	---	44.5	55.5	---	5.0	73.8	1.1	19.6	.6	12400	.05	.23	.32			
		4	14.7	34.9	43.3	6.7	5.5	57.8	.8	28.5	.5	9721	---	---	---			